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### EDITORIAL NOTES.

What is known in England as the insurance bill, a measure providing for the insurance of all wage-earners of a certain class and for their medical attendance in case of injury, etc., has met with a distinct setback. It undertook to legislate the amount of compensation that should be paid to the physician for his services. It raised a storm of protest from the members of the British Medical Association who considered that the compensation fixed by the bill was totally inadequate. It certainly is "contract practice" by wholesale, and the compensation for that sort of practice is usually not large. Something over 27,000 physicians of Great Britain have agreed to refuse the compensation offered in the act and to do no work whatever for the government under it. This action, which is said to have been made official at a special meeting of the British Medical Association July 23rd, of course makes the act a dead letter. The whole incident is, however, very instructive. The original passage of Mr. George's insurance bill, which was called extreme socialism, was but an indication of what many people have said would some day come to pass; that the state would take over the medical care of the people. The refusal of physicians to accept what they consider an *insufficient* compensation does not contradict the probable truth of the assumption; quite the reverse; it indicates that the state will do so under proper conditions.

All over the world there seems to be a wave of fanatical attack upon medical science that has shown more distinctly in the **FANATICAL** United States, and particularly **ATTACKS.** in the West, than elsewhere. It is very difficult to understand.

Of course certain elements of this movement in opposition to scientific medicine are plain enough; the eddyites, the dishonest manufacturing element behind the "league for medical freedom," and the like. But they do not explain it satisfactorily; they do not explain, for example, the remarkable case of the libel action against Dr. Bashford, in England, which was referred to editorially in the August issue of the *JOURNAL*. They do not explain the increasing number of antivaccination societies and of antivivisection societies. They do not explain why honest, educated and presumably sane people will be carried away into these waste places of the ignorant. The editor of *New York Life* is a well educated and presumably sane man, and yet we all know the anti-everything-about-progressive-medicine attitude that *Life* takes. Medicine has passed out of the fetish stage of existence, in the public mind; perhaps the average person likes the fetish thing and so has gone to the place where he can get it—the eddyite and the various other freak cults. It may be that it is because the old medicine is gone and the new, scientific medicine, the people have not yet learned about; they have not become convinced that science has really taken the place of the fetish. But even so, the situation is alarming and not at all easy to understand.

Why do so many physicians want to come to California? A year or two ago, when the matter was looked into, it was found that there was one doctor to about every 400 of population; and several hundred doctors have come in since then. For the August 1912 examination of the State Board of Medical Examiners, 202 applications had been received up to the time when the books close under the law, two weeks before the examination. Of these 194 had filed satisfactory credentials and 8 were pending investigation at the time of writing; we may safely say that at least 200 will take the August examination. If the average number pass, we will have 150 or more newly licensed physicians in an already over-supplied state. Why is it? Moreover, the Governor has said—or at least he is quoted as having said—that he was anxious to have the next legislature pass a very liberal reciprocity amendment to the present law regulating the practice of medicine; an amendment that would permit any physician licensed in any other state to come to California and practice. That would mean no medical law whatever, practically, for any one with a diploma can get a license in some state and then come here and the law would permit him to practice upon an ignorant public, no matter how poorly qualified he might be. It is commonly said that the legislature which is to convene in January will pass any law the

Governor desires, and if that is true then we can be quite certain that California will become, next year and thereafter, the veriest dumping ground in the world for quacks and half-baked, ignorant poorly equipped doctors. The people will, of course, suffer for it, but unfortunately they will not find this out till it is too late; and the general rank and file of the profession will be accused of permitting the disaster to occur, when in fact it is the people themselves that will have permitted it.

A careless and illconsidered word of criticism about some other physician's work may be as successfully the cause of a suit for **CARELESS CRITICIS.** comment. Too many physicians unfortunately are in the habit of looking somewhat patronizingly upon the work of their fellows and when this attitude finds expression in words, the impression made is distinctly unfavorable to the other fellow. Undoubtedly, in very many instances such implied reflections upon another's work are thoughtless and careless; but the result is as bad as though they had been deliberate. The exciting cause of more than two-thirds of all suits for alleged malpractice is to be found in the comment, malicious or careless, of some physician upon some other physician's work. As a rule the critic is not in possession of all the facts (one gets mighty few facts from a patient!) and when a suit is brought and he learns them, he quite frequently suffers no small discomfort and embarrassment. We, as members of the Society, are safeguarding and defending each other's professional interests against unjust and generally blackmailing assault. Should we not be equally earnest in safeguarding each other's professional good name and so prevent many suits that have no foundation in any actual failure to care for a patient properly? The careless critic who arouses discontent in the patient is more dangerous than the malicious one, for his motives are not so obvious and therefore not so easy to explain. When you feel like commenting adversely on some other doctor's work, just stop and think that the same thing may happen to you. And how would you like it?

Public health legislation by the federal government was the subject of much discussion at both the Republican and the Democratic conventions. Our dearly **PLATFORMS AND HEALTH.** beloved Senator Works journeyed to Chicago with a plank in his pocket which he wanted inserted in the Republican platform; but it never came out of his pocket. There was a distinct feeling that it was bad enough for Senator Works to make himself and the Senate ridiculous without plastering any more odium upon the whole Republican party. The Republican platform contains the following plank on public health:

"It will strive not only in the nation, but in the several states, to enact the necessary

legislation to safeguard the public health; to limit effectively the labor of women and children; to protect wage-earners engaged in dangerous occupations; to enact comprehensive and generous workmen's compensation laws in place of the present wasteful and unjust system of employers' liability, and in all possible ways to satisfy the just demand of the people for the study and solution of the complex and constantly changing problems of social welfare."

The Democratic health plank, to which a great deal of opposition was made by the eddyites and the "leaguers," is as follows:

"We reaffirm our previous declarations advocating the union and strengthening of the various governmental agencies relating to pure foods, quarantine, vital statistics, and human health. Thus united and administered without partiality to or discrimination against any school of medicine or system of healing, they would constitute a single health service, not subordinated to any commercial or financial interests, but devoted exclusively to the conservation of human life and efficiency. Moreover, this health service should co-operate with the health agencies of our various states and cities without interference with their prerogatives, or with the freedom of individuals to employ such medical or hygienic aid as they may see fit."

All of this sounds mighty good, but it is an awfully long way from a plank in a platform to a law passed by congress! We have seen many and various planks that went into a platform as good sound lumber but came out looking like a lot of second hand tooth-picks!

The pernicious activity of Frederick Stearns & Co., in the matter of their method of exploiting a "patent medicine" headache remedy, **"SHAC."** was shown up in the *Journal* of the A. M. A. for July 20th. Originally it was advertised as "Stearns Head Ache Cure"; hence the name "shac" which, as it is not a "cure," they were forced to take when the pure food law made extreme falsehood the cause of much unpleasantness. In this country it has become a "remedy"; in England it is still a "cure." The "remedy" or "cure" is nothing more nor less than our old friend acetanilide and caffeine; our dear old friend "antikamnia" and a host of other dear old friend nostrums. But Frederick Stearns & Co., honest and upright pharmaceutical manufacturers appealing to the physicians of this country to use their products, do not wish to be known as at the same time energetically promoting a "patent medicine"—as advertising "shac" in cars, etc. No; they do the dirty business under another name, "The Zymole Company." Why should physicians patronize a concern that does such objectionable business on the side? There are plenty of clean manufacturers that make at least as good pharmaceuticals as Stearns—and *don't* engage in the patent medicine business as well.

The *Annals of Surgery* for July, 1912, comes out as the "American Surgical Association Number." It contains articles by such men as Coley, of New York; Stillman, of San Francisco; Charles Mayo, of Rochester; Willy Meyer, of New York. It also contains advertisements of Fellow's hypophosphites, glycothymoline, glycerine tonic, antiphlogistine, bovine, salhepatica and pasadyne. The *Annals* is published by the J. B. Lippincott Co. They should be ashamed of themselves; they have money enough to publish the *Annals* without taking the nostrum money they get from these few advertisements. But probably so long as men of the class mentioned will write articles for the *Annals*, the publisher will continue to aid in promoting nostrums.

Elsewhere in this issue will be found an article by Dr. Kress on the collection plan of the Los Angeles County Association.

**COLLECTING ACCOUNTS.** The "pastors" to which he there refers, and which he says have made every man who uses them his own collection agency, can be recommended very highly. They certainly do get results and they get them without producing offense. The fact that physicians, as a class, are very careless and negligent in the matter of collecting money due them, has been harped upon repeatedly; but that is not to say that they must always remain so; they *may* improve! The physician who conducts the business side of his profession in a thoroughly businesslike way, receives more real respect from his patients than the one who does not; you have very little respect for any one who is "easy to work"; that is just human nature. These pastors will help you a great deal. A set of them can be had by any member merely for the asking. Send to the Secretary, Dr. Philip Mills Jones, 930 Butler Building, San Francisco, for a set of the pastors and try them. The result will surprise you.

Are you? If not, you should. Every machine, every piece of mechanism needs an occasional rest. Every human being needs an occasional play time. It is awfully easy to get into the habit of thinking that you cannot find the time. But if you make the effort and do find the time, and get away from the everyday grind, you find out very quickly how easy, in reality, it is to do. You owe your patients a certain amount of play time for yourself, each year, just as much as you owe them a certain amount of time for reading and study to keep up. A tired, "stale" doctor is not a good doctor for a sick person to have, and the only way to keep from getting stale is to get away and play, once in a while.

The idea of having all the churches and religious societies in the country take up the subject of the prevention of tuberculosis on some one specified day, has proved to be a very good one; this year will be the third tuberculosis Sunday. Last year some 50,000 churches took a lively interest in the matter and this year it is estimated that about 100,000 will devote Sunday, October 27th, to the cause of preventing needless deaths as well as to that of saving souls. One would naturally assume that a strong, well, wage-earning church member would be much more desirable than a sickly tuberculous who may quite possibly become the forced recipient of parochial charity.

#### TUBERCULOSIS SUNDAY.

#### EPIDEMIC OF POLIOMYELITIS.

An epidemic of poliomyelitis, or infantile paralysis, broke out in Los Angeles in June; it seems to have been reported first on June 10th. Almost immediately cases were noted in the beach resorts near the city and very rapidly the disease was found in other counties. Cases have occurred in Riverside, Ventura, Merced, Sacramento, San Joaquin, and San Francisco counties. A number of places, notably Pasadena, San Diego and some of the San Joaquin valley points, have either taken steps to quarantine against Los Angeles and that section, or have urged, through their respective health officers, that such measures be taken. In Los Angeles the gravity of the epidemic was at once recognized by Dr. Powers, the health officer, and a special committee was appointed by the mayor to handle the situation. Up to August 11th, 205 cases with 41 deaths were reported in Los Angeles. The death rate is not the most important factor in considering the gravity of such an epidemic, for the disease leaves some 90 per cent. of its victims crippled for life. At first the press, with its stupid policy of suppressing the facts in order not to produce a "scare," was uniformly silent, but about the middle of July items began to be published; later, the press gave all the necessary space to putting out the facts, and papers in Los Angeles, Pasadena, Santa Monica, San Jose, Sacramento, Stockton, Coalinga, Hanford, Merced, Santa Ana, and San Francisco (and possibly other places) have published excellent articles on the subject. In Los Angeles a special appropriation was made and placed at the disposal of the special committee in charge, which committee, and the health officer, were given practically unlimited powers to extend and apply quarantine measures as they might deem necessary. The energy with which the situation was tackled in Los Angeles commands one's respect and admiration and gives emphatic assurance that the epidemic will be under control as soon as it is humanly possible.

The present virulent outbreak of poliomyelitis seems to have originated in 1904, for while cases had been reported, from time to time, previously, the figures were never very large. With the year 1904, however, the number of cases reported in-



creased very rapidly; in 1910 there were over 9000 in the United States. Just how extensive this present epidemic in California will be, or just how great a toll of human life the disease will take, it is, of course, impossible to say; but it probably will not be small.

The following rules, issued by the special committee in Los Angeles, should be urged upon all communities in that section of the state and along lines of easy communication; especially along the coast and in the San Joaquin, Salinas and Sacramento valleys:

1. Avoid having children come together, as in picnics, parties and the like.
2. Keep children at home. Allow them plenty of fresh air and sunshine.
3. Keep yards clean and free from every bit of decaying vegetable or animal matter.
4. Keep the premises watered to lay the dust.
5. Keep the intestinal canals of the children active (almost all infected cases are constipated). Give simple, well cooked, easily digested food and plenty of pure water between meals.
6. Cleanliness of children and houses is important. All fruits and vegetables should be cleaned before eating.
7. Flies should be destroyed, as they carry dirt. Windows and doors should be screened (the city will do this when necessary). A good fly killer is a few drops of formaldehyde in a saucer of water. Flies must drink, and this drink will kill them.
8. Children should not be allowed to become exhausted or overtired. This is especially true of those convalescing from the disease.
9. Children who have been infected should be made to rest. This is important, and should be insisted upon as long as there is any pain in the joints or muscles.
10. Report every sick child to the health department. This is important. The services of physicians and attendants is offered free.

#### RECENT CONCLUSIONS REGARDING SYPHILIS.

Judging from the discussions at the Seventh International Dermatological Congress (Rome) attended by the writer, and recent visits to various European clinics, the following can be offered as representing the most advanced opinion bearing on the treatment and prognosis of syphilis:

The finding of the treponema pallidum and a positive Wassermann reaction together, even in the absence of other symptoms, is sufficient to establish a diagnosis of syphilis. As an early diagnosis is now possible and as prompt treatment offers the best hope of an absolute cure, the disease can be treated much more effectively than formerly, and in such agents as salvarsan and mercury we have powerful weapons with which

to kill off the causative organisms. By injecting salvarsan at the very earliest possible time and by giving mercury later, one can get rid of the greatest number of the treponemata. If the patient appears for treatment after the primary sore has developed, extirpation of the focus effectively eliminates an immense number of the organisms, and several intravenous injections of salvarsan followed by mercury will promptly dispose of those which at that period exist in large numbers in other parts of the body. The single large dose of salvarsan is not being given so much now. The drug is injected intravenously, usually in divided doses at weekly intervals for several weeks, and then followed by mercury. The length of treatment is determined by the Wassermann reaction. It has been observed that relapses are much less frequent when salvarsan and mercury both are administered. Various arsenical preparations are advocated by different workers, but none have proven as effective as salvarsan. Neosalvarsan (Professor Ehrlich's latest modification of the drug) has proven to be fully as active as salvarsan and gives promise of being more valuable. This new drug, which is now on the market, is obtained by the action of formaldehyde-sulphoxylate on salvarsan. It dissolves readily in water with neutral reaction, so that no reagents are required in preparing it for injection. It may be given in larger doses than salvarsan, but with patients having cerebral or meningeal symptoms, small doses should be given at first. Although the solution is very easily prepared, certain precautions must be observed; the distilled water should be freshly made and at the room temperature (20 to 22° C) and the solution must be injected immediately after it is prepared, as it is more unstable than salvarsan. It should not be warmed afterwards. If these rules are not rigidly observed, there is danger of highly toxic products being formed. The Wassermann test made at intervals over a long period, gives the most reliable information concerning the patient's true condition. A positive reaction repeatedly found even in the absence of all other symptoms enables one to recognize the presence of the disease, and no patient can be declared cured without this having been done. Observations of the reaction have shown that in the past many discharged syphilitics have remained uncured. In later years various manifestations probably will appear in such unfortunates. It is well established that the best means of determining the efficiency of treatment is in having this test made.

Pure cultures of the organism have been obtained and animals have been successfully inoculated with the same, but immunization by means of serotherapy has not been accomplished so far. It has been shown that after a cure in animals inoculated with syphilis and in human cases, reinfection is possible and the disease pursues the usual course. Reinfection is readily accomplished also during the first incubation period, but not so readily during the second incubation period. During the latter phase, if reinoculation is successful, usually there is produced a papule, but there may occur a typical sclerosis. In the tertiary period



successful inoculation produces a lesion greatly resembling a gumma. When the system is under the influence of constitutional syphilis (especially in the first year of the disease) the skin is immune to fresh inoculations, unless the inoculated material is exceptionally rich in treponemata, in which event local superinfection can be produced. The three great remedial agents in the treatment of syphilis to-day are salvarsan, mercury and iodine, and although mercury was temporarily displaced, it is gradually returning to its former position.

In the first period of syphilis abortion of the disease seems to be possible; during the second period, a cure is less readily brought about, and in the tertiary period it is doubtful if a cure is ever accomplished, and the best that can be done here is to abolish the symptoms as they appear. Even at this day, when so many thousands have been treated by the new remedies and the treatment checked up by the Wassermann test, no one knows what the future will prove. Relapses are reported more frequently than before. Those cases that were given several large injections of salvarsan and also mercury, so far have shown the most favorable behavior.

H. E. ALDERSON.

#### THE COLLECTION BUREAU PLAN OF THE LOS ANGELES COUNTY MEDICAL ASSOCIATION.\*

By GEORGE H. KRESS, M. D., Los Angeles.

About three years ago, the writer of this article corresponded with the three or four county medical associations in the United States which were trying to maintain collection bureaus as part of their activities. This correspondence demonstrated that no matter how splendid a theoretical proposition a collection bureau adjunct of a county medical unit might be, that in practice it was one which could result in a serious financial deficit to a county medical association; as witness the experience of one or two societies that had tried to maintain such bureaus in eastern communities.

For it is to be remembered first, that honest attempts to courteously and yet firmly insist on the payment of overdue bills, especially of bills for professional services in small amounts, in widely scattered portions of the community are by no means carried out without the expenditure of thought, effort and money. And when to this is added the indifference of county society members to cooperate by sending in to such a bureau their good collectible accounts, plus a decided inclination to unload on the bureau a host of virtually outlawed accounts, it can be imagined how small a chance there is to conduct such a doctor's or medical society's collection bureau on a profitable basis.

Profiting, therefore, by the experience of other county societies, we early decided to obligate the Los Angeles County Society in no such manner, contenting ourselves with making a contract

with a private collection bureau, but sending to every member by mail a large envelope containing about one hundred follow-up letters and an especially printed booklet containing blanks on which to send names of delinquent clients to the collection bureau, and other memoranda concerning delinquent patients.

The Los Angeles Society Collection Bureau Outfit of 1911 consisted of such a report booklet and five envelopes each containing twenty slips, size, three by five inches. The wording of each of these slips will be found at the end of this article.

The Collection Bureau of 1912 contained the above, plus an envelope in which was enclosed twenty-five gummed slips, on each of which was printed in red ink, seven different "follow-up" notices, the different notices being torn off as needed, along perforated lines. The entire gummed slip measured eight by three inches and each of the seven notices thereon measured one by three inches. There were a total of about three hundred "follow-up slips" or notices in each outfit.

So much for the plan. The important question is as to how it actually worked out in Los Angeles.

That part of the plan which has to do with the collecting agency has not been successful, for the reasons already given as applying to Eastern societies and which two years' experience in Los Angeles has demonstrated, applies also to that city. Physicians there, as elsewhere, seem to prefer dealing with individual collecting agencies rather than with one common bureau; but the other part of the plan and especially the gummed "follow-up slips" to be attached to the bills of delinquents, have done very excellent service. It has been the complaint of the Collection Bureau Manager with whose company we have done business, that we have made every member of the Society his own collector, with these slips, so that only the accounts of the hardened delinquents, as a rule, reached his company.

Judging from the comments of Los Angeles County members it may be stated that our experience with this plan has been very favorable and we believe the State Medical Society would profit tremendously if an outfit of the gummed slips at least, were sent to every member of the State Society every year, say at the same time the State Register was distributed. The cost of printing these slips would be inconsequential and if desired, the Los Angeles County Society would gladly loan its electroplates for this purpose.

In order to bring this matter to the attention of the county medical societies in California, a complete Los Angeles County Society outfit will be sent to the secretary of every county unit, about the time this article is printed, with the request that the attention of the Society be called to these outfits and the plan explained.

The State Councilors will gladly send to all who so request, sets of the gummed slips. All such requests should be sent to the Secretary of

\* Written for the Journal of the Medical Society of the State of California at the request of the Board of Councilors of the State Society.

the State Medical Society, Dr. Philip M. Jones, Butler Building, San Francisco.

If sufficient interest is manifested in the plan, such a distribution of gummed slips will be made to all members of the State Society, each year and without cost to them, and it may be possible for the State Councilors to elaborate some other plans related to the above, if sufficient interest and co-operation is shown by the members at large.

Certainly if all the members of the State Medical Society, from one border of the state to the other, would begin to use a uniform system of "following up" delinquent clients, the influence on the community and on the profession could not be otherwise than good.

What is done, however, will depend largely on what the members show they want. If you want some of these slips, write to the State Secretary for them.

#### SYMPOSIUM ON THE WASSERMANN REACTION AND SALVARSAN TREATMENT IN SYPHILIS.

##### CONCERNING THE STANDARDIZATION OF REAGENTS FOR THE WASSERMANN TEST.\*

By WALTER V. BREM, M. D., Los Angeles.

The value of the Wassermann test is no longer a question open for discussion. Its great value in syphilitic infections as a diagnostic measure, as a guide in the treatment of the disease, and as the only criterion of cure, has been so abundantly proved by competent investigators that the presentation of further statistics regarding the percentages of positive and negative reactions in various clinical conditions and stages of the disease, is but to carry "coals to Newcastle." In other words, the test has already been so carefully scrutinized by able men in the light of clinical phenomena, that clinical reports at variance with established values obtained by properly conducted tests demand the exhaustion of at least two lines of investigation before the test itself can be attacked.

1. A critical analysis of the clinical phenomena reported.
2. An examination of the reagents used in the test.

For example, Newmark<sup>1</sup> has recently reported positive Wassermann tests from the serum and cerebrospinal fluid of two patients with tumors of the central nervous system. At autopsy on the body of one of these patients, a "gliosarcoma" of the brain and a carcinoma of the breast were found. At operation upon the other patient an intradural psammoma was removed and the patient recovered. In neither instance was there any evidence of syphilis discovered other than the positive Wassermann tests. Waiving a discussion of the possibility of latent syphilis, to which Newmark amply calls attention, the second investigation leads to an examination of the reagents used.

Newmark dismisses this subject by saying that "the examinations of the blood-serum and cerebrospinal fluid were made by men whose experience with the method now extends to thousands of cases." It may be true that these men are experienced and careful and that their reagents were ideal. As a clinician not actively familiar with the intricacies of the test, Newmark was perhaps justified in not asking for and incorporating in his paper a detailed account of the technic used and of the titre of the reagents. But those of us who have suffered in the making of the reagents and in their accurate titration, must ask for something more than we were given before we can accept the results. In the light of data that I shall report below, one can see how necessary it is to have detailed information before accepting phenomena at variance with results obtained by able investigators whom we know and have learned to trust. The *Journal of the American Medical Association*, without a consideration of the reagents used in the tests above referred to, attempted in an editorial<sup>2</sup> to account for the non-specific complement-fixations in this and other Wassermann tests by advancing statements of three possibilities. The first possibility, while it must be admitted, seems almost too remote to be seriously considered, and it fails completely when Noguchi's acetone-insoluble fraction of the alcoholic extract of fresh beef-heart is used as an antigen. The second and third possibilities are inadequate as explanations if the tests were properly controlled and the reagents accurately standardized. This brings me to the theme of my paper.

It is my opinion that advance in the use of the Wassermann test is not to be made by further complications of statistics, but by the demand from the medical profession for carefully standardized reagents. It is with the hope of helping to stimulate this demand that I have chosen as my theme to-day, "The Need of Carefully Standardized Reagents in the Wassermann Test," and I may add, of a uniform method of making the test. At the present time there are almost as many so-called Wassermann tests as there are men making them, and as there are different sets of reagents used. It is obvious that this complicates results and brings upon the test undeserved criticism in sections where it is abused.

On one occasion, while my own reagents were being made, I obtained and attempted to use reagents issued from an advertising laboratory that not only offered to furnish reagents to the profession, but also to teach physicians how to do the Wassermann test. The reagents that I obtained were an alcoholic extract of syphilitic liver for antigen and human and sheep-rabbit immune sera for amboceptors. The antigen was so strongly hemolytic that it was useless, and the human-rabbit amboceptor was of such a low titre and poor quality that it also had to be discarded. I had an extremely unsatisfactory correspondence with this laboratory regarding its reagents, and was told that no matter if the antigen was hemolytic, it would work in the test; that patients' sera were

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.

likewise hemolytic sometimes, but they also would work in the test. I was told to reheat the amboceptor to restore strength lost by its having been off the ice during transit.

This experience suggested to me the advisability of investigating reagents generally used in making the Wassermann test, and I wrote to other laboratories asking if they sold reagents to the profession, and ordering from each the following reagents:

Alcoholic extract of syphilitic liver.

Noguchi's acetone-insoluble antigen.

Sheep-rabbit amboceptor.

Human-rabbit amboceptor.

I obtained reagents from six laboratories, only one of which advertised or sold them generally to the profession. I bought the reagents from three laboratories, and three very generously and courteously presented me with them. The reagents obtained were:

- 4 antigens—alcoholic extracts of syphilitic livers.
- 2 antigens—Noguchi's acetone-insoluble fractions.
- 4 amboceptors—sheep-rabbit serum.
- 1 amboceptor—human-rabbit serum.
- 1 amboceptor—human-rabbit serum dried on paper slips.

These reagents were titrated and the titres compared with the standards required respectively for the Wassermann and the Noguchi tests, and the quantities recommended for use by the laboratories issuing them were considered in the light of the titrations.

#### ANTIGENS.

1. Alcoholic extract of syphilitic liver. This antigen was not hemolytic and was only slightly anticomplementary in a 1 to 5 dilution. The same quantity of half the strength producing anticomplementary action did not show the slightest power to fix complement in the presence of positive syphilitic serum. The laboratory issuing it recommended its use in a dilution of 1 to 10. The antigen was not serviceable.

2. Alcoholic extract of syphilitic liver. Strongly hemolytic in 1 to 40 dilution, tendency shown toward anticomplementary action, but masked by hemolytic property. More than half the quantity producing complete hemolysis caused incomplete fixation of complement in the presence of positive syphilitic serum. The laboratory issuing this antigen wrote that it could not give the exact titre as it used a drop method of its own. Antigen was not serviceable.

3. Alcoholic extract of syphilitic liver. Slightly hemolytic in 1 to 10 dilution but not anticomplementary. Half the quantity producing faint hemolysis had no power to fix complement in the presence of positive syphilitic serum. The quantity recommended by the laboratory would produce faint hemolysis. The antigen did not come up to the standard for the Wassermann test, and could not be considered serviceable.

4. Alcoholic extract of syphilitic liver. Strongly

hemolytic in 1 to 20 dilution, apparently not anticomplementary, but this property may have been masked by the hemolytic action. Half the quantity that just failed to produce hemolysis caused incomplete fixation of the complement in the presence of positive syphilitic serum. The quantity recommended by the issuing laboratory was sufficient to produce complete hemolysis. Antigen not serviceable.

5. Noguchi's acetone-insoluble fraction. Slightly hemolytic in 1 to 10 dilution, but not anticomplementary. One-twentieth of the quantity that produced very faint hemolysis caused incomplete fixation of complement in the presence of positive syphilitic serum. The antigen was not quite up to Noguchi's standard. But owing to the high standard that Noguchi imposes the range of safety is great, and an antigen not coming strictly up to his standard might be serviceable.

6. Noguchi's acetone-insoluble fraction of beef heart. Not hemolytic or anticomplementary. Complete fixation of complement in less than one-fortieth the quantity used for hemolytic and anticomplementary tests. The antigen had more than twice the antigenic strength required by Noguchi, and was not hemolytic or anticomplementary.

*Summary.*—Of six antigens obtained from different laboratories, four of them were either too hemolytic or too weakly antigenic to be used in the Wassermann test. All of these were alcoholic extracts of syphilitic livers. One acetone-insoluble antigen was usable, but did not quite meet with Noguchi's requirements. The last antigen, also Noguchi's acetone-insoluble fraction, was most excellent and more than met the high standard set for these antigens.

#### AMBOCEPTORS.<sup>a</sup>

1. Sheep-rabbit. A 1-1000 dilution caused complete hemolysis with one unit of complement in one hour. The titre given by the laboratory that issued it was 1 to 1000. The amboceptor was good and the titre correctly given. Agar slants inoculated remained sterile.

2. Sheep-rabbit. Titre slightly greater than 1 to 1000. Quantity recommended for the test, 1 capillary drop of a 1 to 30 dilution. This quantity is equivalent to nearly four units of amboceptor, the use of which would obscure weak reactions. One of the other laboratories from which we obtained antigens used the amboceptor furnished by this laboratory. The amboceptor itself was usable, but seemed to be inaccurately titrated. Transplants on agar remained sterile.

3. Sheep-rabbit. Titre slightly greater than 1 to 4000. Titre not given by laboratory which, however, advised reheating "to restore deterioration." Transplants on agar slants showed contamination of the serum with bacteria. The container was closed with a cork stopper, but the amboceptor did not appear to be injured, and was an unusually powerful one.

4. Sheep-rabbit. Titre 1 to 1100. Titre correctly given by laboratory and there was no deterioration in transit from coast to coast. Transplants showed the serum to be sterile.



5. Human-rabbit. Titre less than 1 to 33. The strength was far short of that required by Noguchi; the serum was shipped in a cork-stoppered bottle and was contaminated with bacteria. No titre given by the issuing laboratory.

6. Human-rabbit. The serum was dried on paper slips according to Noguchi's method, and we were directed to use 5 mm. for the test. Five mm. presumably represented, therefore, two units, and 2.5 mm. should have been the titre. It was found, however, that 5 mm. failed to produce complete hemolysis in one hour. The amboceptor was good but was apparently inaccurately titrated. However, it is possible that there was deterioration of the paper slips before it was titrated.

**Summary.**—Five out of six of the amboceptor sera were of good titre and quite serviceable, but according to my titration only two of four were correctly standardized, and in two instances no information was given by the issuing laboratories. The strength given for the seemingly incorrectly titrated amboceptors was less in one instance than the actual strength, so the disparity was not due to deterioration; in the other instance the strength given was greater than I found it.

The results of the titration of these reagents are astounding if correct. Granting that they are correct, the next question that arises is whether or not the reagents are representative. In answer I would say that they were obtained from two laboratories in the East, three in the Middle West, and one in the West; five of them are well known laboratories and one the private laboratory of a physician. The last was the only one from which I obtained a good and accurately titrated set of reagents. I am obliged to think then that the results represent general conditions.

Fortunately, if reagents are not excessively bad, sera without syphilitic lipotropic substances (Noguchi) will give a negative test, and sera rich in these substances a positive test. It is with the intermediate group that the difficulty arises, and with this group of sera with poor lipotropic content the most carefully manufactured and titrated reagents are necessary, and they should be most carefully measured. I feel strongly that much of the loose work that has been done in connection with the Wassermann test has been due to the numerous short cut "drop methods now in vogue, and to the abandonment of the more tedious but more accurate method of diluting and measuring the reagents. I believe that only in this latter way can the important quantitative relation between the reagents used be preserved, and the test be brought to the highest point of efficiency. Here I would put in a plea also for the use of only high powered reagents (antigens and amboceptors) in the test, for the reagents must be diluted to such a degree that all extraneous influences must be diluted out and only the specific bodies left in sufficient concentration to act appreciably. Noguchi's antigen, the acetone-insoluble fraction of the alcoholic extract of organs (Noguchi prefers a fresh beef-heart) when properly standardized, is, I believe, far superior to other

antigens, because its antigenic value is so great that it can be used in a very dilute emulsion. It thus affords a wider margin of safety and enables one to use a smaller quantity of complement than he would dare to use with other antigens. For a similar reason the sheep-rabbit amboceptor seems preferable to me, and also because a good human-rabbit amboceptor can be obtained only with considerable difficulty. I would advocate, therefore, the use of the Wassermann system as modified by Noguchi; that is, the Wassermann system in which Noguchi's acetone-insoluble antigen is substituted. To offset possible hemolytic bodies for sheep corpuscles in the human sera (which is Noguchi's chief criticism of the Wassermann test), one can use with these high powered reagents, and with carefully controlled tests, a smaller quantity of complement in an extra tube. I have been using for some time such an extra tube in which is placed only one unit of complement, with two parts of the serum to be tested. This tube is run in each test in addition to the usual tubes with two units of complement. At first I was doubtful about my ability to use successfully this tube with only one unit of complement in it, but as time has passed, I have come to depend a great deal upon it, and the interpretation of some of the weaker reactions is made much clearer by its presence. It is of particular use in enhancing the value of a negative test when in it hemolysis is complete. But I feel that it is of value also when a considerable degree of complement fixation occurs in it. In several instances, once in a fading test after salvarsan injection, there has been complete inhibition of hemolysis in this tube, while the complete hemolysis in the other tubes would have indicated a negative test. Our interpretation was that the two parts of serum was just rich enough in lipotropic substances to fix one unit of complement, and that the unit left free in the tubes in which there were two units was sufficient to cause complete hemolysis and mask the weak reaction. However, I cannot insist too strongly upon the necessity of having high powered, accurately titrated reagents before this sensitive tube can be used with safety.

#### SUMMARY.

1. The value of properly conducted tests is no longer an open question for discussion, it is proved beyond dispute.

2. When reported results appear to discredit the test, both the clinical phenomena reported and the reagents used must be carefully examined before the test can be attacked.

3. Titrations of reagents obtained from six different laboratories gave the following results:

6 antigens:—

good 2,

bad 4.

6 amboceptors:—

good 5,

bad 1.

The titre of the amboceptors were apparently given erroneously in two instances, not given in two, given accurately in two.

4. Greater care is needed in the manufacture and titration of reagents, and it is believed that the drop method of making the test should be abandoned, and the method of diluting and measuring the reagents resumed.

5. Noguchi's modification of the Wassermann system with the high powered reagents and great dilutions it enables one to use, is thought to be the system of choice.

6. The use of an additional tube containing only one unit of complement is advocated. It can be used only with high powered reagents and in carefully controlled tests, but when carefully guarded may yield information of great importance.

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### PROGRESS IN THE DIAGNOSIS AND TREATMENT OF SYPHILIS.\*

By ERNEST DWIGHT CHIPMAN, M. D., San Francisco.

The transitional stage through which syphilology has been passing in recent years makes much of its literature obsolete. This is particularly true of those chapters devoted to etiology, diagnosis and treatment each of which must now be written anew. The particular events which make this necessary are the discovery of a specific causative organism, the development of serological tests and the addition of salvarsan to our therapeutic armamentarium. These were all dramatic events; so much so that, without minimizing their value, it may be pointed out that there exists the danger of other factors which are not unimportant being relegated into comparative obscurity.

The matter of diagnosis has largely passed from a clinical into a laboratory affair and whether the tendency is exaggerated or not is a question which will bear examination. First, however, considering the question of diagnosis as divided into these two departments, let us see what the laboratory does for us.

Of paramount importance is the demonstration of the spirochete for this accomplished the diagnosis is made. The importance of an early positive diagnosis is becoming more and more apparent now that the marked success of early treatment with salvarsan is so well proven. Recent as is the introduction of the dark field condenser as a means of demonstrating the treponema a still newer method is rapidly coming into favor, namely, the staining of smears by India ink. The advantage of this method is its simplicity and the rapidity with which it allows one to establish a diagnosis. It depends upon the fact that bacteria do not take the stain, their presence being indicated by blank spaces in thin smears. Many laboratory workers, however, still prefer the dark field condenser.

While the finding of the treponema establishes

a diagnosis beyond doubt the failure to demonstrate it is not proof positive of the absence of the disease. The organism may not be in evidence for several reasons though the subject be infected. These reasons are errors of technic, previous local or constitutional treatment and the age of the lesions as well as sometimes their location. By errors of technic is especially meant the collection of the material which preferably is from a recent lesion, care being taken to get serum from tissue somewhat below the surface. A superficial smear is likely to reveal the presence of the spirocheta refringens which, however, only shows general points of resemblance with the treponema. The demonstration of the specific organism is definitely a laboratory triumph.

A second laboratory aid to diagnosis is the histological examination of tissue. This may be for the detection of the spirocheta by special staining methods, particularly in early lesions or, in later lesions, for the information which the general architecture and the character of the cellular infiltration afford. Syphilitic lesions usually show marked endothelial thickening, numerous plasma cells and chorioplaques as well as a somewhat special arrangement of the cells composing the infiltrate.

The laboratory examination of the cerebro-spinal fluid may prove of value. Aside from serological tests, presently to be referred to, other factors are worthy of consideration. Lumbar puncture may reveal either normal or hypertension. The general appearance of the fluid shows nothing specific. Cytologic examination of the fluid shows marked lymphocytosis and chemical tests show increased globulin which in normal fluid is present in quantities too small to react with ordinary methods. Most American writers apparently attach value to lymphocytosis and increased globulin only when in accord with clinical findings. For example, to quote Strouse, "both increased globulin and lymphocytosis are present in inflammatory conditions of the meninges like tuberculous meningitis, but the clinical history of the latter condition is not likely to be confused with the history of general paralysis, tabes, or cerebral syphilis." According to Gastou, "the presence of an exaggerated lymphocytosis always indicates in syphilis the participation of the nervous system and should make one think of syphilis in any patient in whom it is found."

The inoculation into apes and chimpanzees is well known. Not so commonly known is the fact that in the rabbit, by scarification of the border of the cornea or by the introduction of the spirochete into the anterior chamber of the eye, there results after a month or six weeks a specific parenchymatous keratitis which remains local, not developing subsequent lesions but from which the spirochete is recovered in nearly pure culture.

Although the diagnosis of syphilis by serum agglutination tests is at present not feasible the fact remains that in one case it was accomplished (Zebolotry) by using syphilitic serum acting upon the spirochete contained in the serum escaping

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from syphilitic lesions on the application of a Bier cupping apparatus.

An additional method is suggested by Nicolas and co-workers, the point of which is that the subcutaneous injection of tuberculin gives a reaction quite as positive in generalized syphilis without tuberculosis as in tuberculosis itself. The conclusion is based upon a series of eleven cases representing every stage of syphilis in activity. One of these cases in the primary stage was negative—whether or not it later became positive was not stated. In ten generalized cases nine were positive. Certain objections to this conclusion are obvious and it may be justly said that the experiments were insufficient. It raises a question, however, worthy of accurate determination if for no other reason than that in some doubtful cases where the diagnoses balance between syphilis and tuberculosis a positive tuberculin reaction may not lead one astray. The same observer had previously attempted a skin reaction with a substance which he called syphiline. This, for the lack of cultures, was made from the liver of a syphilitic fetus. It was in the form of a glycerin extract concentrated by heat to 115° C. The results following its use were doubtful and inasmuch as no reference is made to it in a subsequent article dealing with the use of tuberculin it may be assumed to have been abandoned.

The so-called method of Porges which is based upon a precipitation with glycocholate of soda has been apparently discredited.

Perhaps more promising is the progress of Noguchi with a substance called "luetin" designed to furnish a skin reaction diagnostic of syphilis. This substance is a suspension of spirochetes artificially grown under anaerobic conditions in ascitic fluid and ascitic fluid agar to which animal tissue has been added. The results to date in late syphilitic cases, especially treated cases, have been most uniform. In parasyphilitic affections the results have not been so convincing. The difficulty in growing the organism and maintaining sterility is so great that it serves to delay the hope that a satisfactory, ready at hand diagnostic test will be evolved.

Meanwhile there remains as the most practicable laboratory contribution to the diagnosis of syphilis, the Wassermann reaction and its modifications. To keep pace with the literature which has sprung up about this one phase of the subject is a consummate task. Without using time for the discussion of various questions of interest chiefly to laboratory workers, let us come at once to the broader question of the significance of these reactions.

It may at the outset be conceded that the laboratory has had and is having its very definite triumphs in the diagnosis of syphilis, triumphs so impressive that one may not wonder at the temptation to ignore everything else in the making of the diagnosis. There remain, nevertheless, certain words of warning to be spoken. First of all, the reliability of the test is to be considered. Competent syphilographers estimate that fifty per cent. of all serological tests as performed throughout

the land are worthless. This opinion is based upon contradictory results reported by different laboratories from identical specimens in many instances. Next is the proper interpretation of the reaction, assuming it to be properly performed. Perhaps the most commonly accepted generalization which can be made concerning the significance of the Wassermann test is that a positive reaction indicates syphilis present, while a negative reaction usually shows syphilis to be latent or absent. It is of great importance, however, that the clinician should make correct interpretation of laboratory reports and square them intelligently with the clinical findings. Every one has seen cases in which syphilis was manifestly present yet which gave negative laboratory reports and, conversely, we have all been given positive findings from the laboratory when our utmost clinical acumen could reveal nothing.

There is nothing in this which vitiates the essential soundness of the serological tests. In making our interpretation we must reckon on a certain percentage of late luetics who do not respond to the test and we must allow for the possibility of error in the laboratory.

Many apparently anomalous instances might be cited. Cases in point are: First, two cases of syphilitic sucklings born of mothers of healthy appearance. The reaction is positive in father, mother and child. The mothers of healthy appearance and coming under Colle's laws are in reality, then, syphilitics without symptoms.

Second, a syphilitic father has positive Wassermann while mother and child give negative Wassermann. The child, however, is ill-nourished and cries without ceasing. Specific treatment is given and immediately the weight curve ascends and the crying stops.

Third, a suckling with pemphigoid lesions and positive Wassermann reaction has parents with negative Wassermann. Inquiry finally elicited the fact that the real father of the child was not the husband of the mother who was the man examined.

The conclusions arrived at by Levaditi and Latapie from an analysis of results of all the tests made at the Pasteur Institute for a period of over three years are that it enables us to ferret out the disease where there are only presumptions; that the positive reactions become more rare the longer the time that has elapsed from the infection and that two factors enter into this modification of the reaction, viz.: the duration of the disease and the fact that it has been treated. In reality these two factors must often be confused, inasmuch as mercurial treatment, in the opinion of competent syphilologists, is only efficacious if often repeated. They believe it premature to say that the significance of the Wassermann reaction is definitely settled concerning the prognosis or definite cure of the patient. If asked for a yes or no answer to the question as to a cure, they declare themselves incapable of answering and affirm that the problem will only be settled when one knows the future of those syphilitics with neither lesions nor



symptoms but with a positive serum reaction, and when one knows if, in the absence of all treatment, or in spite of treatment, they recur sooner or later.

This brings up the consideration of the relation between laboratory and clinical findings. The purpose of such a comparison is not to cavil at or disparage the results of laboratory diagnosis, but rather to warn against a blind acceptance of laboratory reports without due consideration of the possibilities of error or in the face of what yesterday would have been thought incontrovertible clinical evidence to the contrary.

Now the diagnosis of syphilis is a matter of grave importance as, conversely, the establishment of its non-existence would be if that were possible. The danger lies, then, in the fact that, in an excess of enthusiasm, what should be considered as a valuable adjunct is construed as an infallible guide, above and beyond any confusion of test tubes or errors of technic even granting its intrinsic soundness.

As a possible example of the harm which might accrue, let us suppose a patient with a lesion which is easily a close decision between syphilis, tuberculosis and epithelioma. Now the enthusiast feels that a Wassermann reaction will reveal everything. Accordingly it is performed, a positive reaction is reported and salvarsan is immediately injected. A surprise is in store, for there is no improvement in the lesion. Another, and then another injection of salvarsan, reinforced by mercury and iodide, follow, while finally a forlorn hope operation for epithelioma is the result of failure to appreciate the very obvious fact that even in the presence of a positive Wassermann reaction every lesion of the skin is not necessarily syphilitic. So far as is known there is nothing about syphilis which gives immunity to other dermatoses.

Fairly typical is the case of a man who consulted me for lesions of his hands which appeared eczematous. A history of syphilis was elicited, however. On the day of the first consultation he was given local treatment for the eczema and blood was collected for serological test. Upon his return one week later, although he was given a positive Wassermann report, his hands were well.

In a symposium such as this some repetition will be avoided, perhaps, if we confine our remarks on treatment to a few special phases. The old question as to when treatment should be begun is not now debatable. Either the demonstration of spirochetes or a positive Wassermann is a definite indication to proceed regardless of secondary signs.

In the development of specific treatment there is one dangerous tendency we should strive to avoid and that is to consider the case treated when we have used the remedy. Injecting salvarsan when the laboratory report is positive seems so obviously the right thing to do that one is apt to forget the general directions which we owe the patient and which may have such great bearing on his welfare.

Under this head the need should be empha-

sized for a rigorous hygiene with moderate exercise always avoiding violent exertion. Proper hours, a non-stimulating diet and the exclusion of alcohol and tobacco should be directed. Both physical and mental overwork should be particularly guarded against. In short everything possible should be done to tranquillize the patient from the point of view of the nervous system, the vascular system and the digestive system.

Concerning treatment with salvarsan I purposely refrain from extensive remark as I feel more like listening to the discussion than formulating dogmas. Of a few facts I feel tolerably certain. First of all I agree heartily with Nichols who said in a recent number of the *Journal of the A. M. A.* "There is no room for any doubt that salvarsan is a specific for the spirochetes of syphilis. Whether or not it is a specific for the disease depends, to my mind, simply on the question whether or not the spirochetes are accessible to the drug."

The fact that salvarsan has, without recourse to any adjuvants, effected many cures is of course incontestable. The best possible proof of this are the increasing numbers of reinfections which are constantly being reported after treatment with this remedy. One such case came to my notice at a meeting of the French Dermatological Society last November. The patient, a young man was first observed with a chancre in which spirochetes were found. The blood reaction, at first negative, rapidly became strongly positive. Four injections of salvarsan, .3 gms., were given intravenously at intervals of one week. One month after the fourth injection the blood reaction was negative. In another month he reappeared with a chancre from which, as before, spirochetes were obtained. The blood reaction at this time was negative but in a short time became strongly positive.

The occurrence of exacerbations of nerve symptoms, frequently observed after the administration of salvarsan and by some interpreted as toxic results of arsenic, is I believe really due to the fact that the initial dose has, while killing the free spirochetes, only caused the escape of others from close tissue combinations and therefore far from contraindicating salvarsan really calls strongly for further injections. Nichols explains these neuro-recidives on the ground that the great bulk of spirochetes are killed at one blow and that if any remain they are too few to stimulate the resistance of the body. They begin to multiply, however, after a time, and suddenly flood the tissues again, and, if the brunt of the attack falls on the nervous system, serious consequences may ensue, such as convulsions, deafness, blindness and so forth.

The question as to whether the spirochetes become habituated to mercury and salvarsan seems by experimental evidence to have been answered in the affirmative as regards mercury and in the negative as regards salvarsan. The lesson this teaches is that our modern methods of mercurial administration have not been sufficiently intense and that we would do better to return to the

fashion of our forefathers and give bigger doses even at the risk of losing a few teeth.

There remains a most important consideration, namely the prophylaxis of syphilis. The same decade which has shown such wonderful progress in the diagnosis and treatment of this disease has seen the subject of prophylaxis lagging hopelessly in the rear even in spite of earnest efforts directed toward its advance. A notable contribution to the subject was the publication of a brochure by Bayet of Brussels and Malvos of Liège (*La Prophylaxie Sociale de la Syphilis devant les récents progrès de la Syphiligraphie, Bruxelles 1911*). In this work the authors, after discussing the subject from many angles, arrive at the following conclusions:

1. By reason of the recent advance in syphilography and the demonstrated efficacy of arsenical preparations in causing the rapid disappearance of the infectious lesions of syphilis, it is necessary radically to modify the defensive social measures against the disease;

2. Above all, therapeutic means must be taken to sterilize the infected subject—the carrier of germs, the direct agent of transmission of the disease in the great majority of cases;

3. To attain this, treatment must be made easily available to the largest possible number of subjects;

4. To this end many centers (laboratories) should be established where physicians may easily have made the necessary examinations for the early and rapid diagnosis of the infection (search for spirochetes, serum-reaction);

5. Evening consultations should be established in hospitals and clinics;

6. There should be obtained the repeal of by-laws in mutual societies and public institutions which refuse medical aid to patients suffering from venereal disease.

7. There should be created anti-syphilitic dispensaries, on the lines of the anti-tubercular dispensaries, where the patient can have free treatment and remain under the observation of his physician during and after his illness;

8. Compulsory attendance of medical students in the clinics for syphilis should be the rule besides post graduate courses to spread among physicians the knowledge of the technic not only of the treatment but of the collection of the materials to be sent to the laboratory.

9. Radical and energetic measures must be taken against charlatanism.

#### EHRLICH'S 606 IN EUROPE.\*

By CHARLES D. LOCKWOOD, M. D., Pasadena.

The material for this paper has been gathered partly from a recent visit to the clinics of Europe and partly from a thorough review of the literature, in which I have been aided by the Nelson Research Bureau.

Since Alt, to whom Ehrlich first entrusted the use of salvarsan, first published his report of fifty

cases in March, 1910, a mass of literature, chiefly in German and French, has appeared, giving case reports and general conclusions regarding almost every phase of the use of salvarsan in the treatment of syphilis. Ehrlich estimates that from twenty-five thousand to thirty thousand cases have been treated with salvarsan in the clinics of Europe alone. Wechselsmann of Berlin reports fourteen hundred cases from his own clinic, in his recent book.

Notwithstanding the vast amount of experience in the use of salvarsan, its use has hardly advanced beyond the experimental stage. There is a wide difference of opinion in Europe as to the proper dosage, the number of treatments necessary to effect a cure and the methods of administration. The acid solutions at first used for subcutaneous and intramuscular injections have now been largely abandoned in favor of a neutral suspension, an oily suspension or slightly alkaline solution of the drug. The alkaline solution is usually prepared with normal sodium hydroxide and distilled water. Two methods of administration are in common use in Europe, the deep intramuscular injection and the intravenous. The subcutaneous injection is only used as an adjunct to one of the two preceding methods. Although many authorities prefer the intramuscular method, Ehrlich has decided in favor of the intravenous injection of salvarsan, followed by a subcutaneous injection.

The intramuscular injection is characterized by local pain and soreness, lasting from four to ten days, while the chief reaction from the intravenous use of the drug is constitutional, i. e., fever, nausea and general malaise. The symptoms subside within twenty-four hours. There are many variations of opinion as to dosage and time of administration. Lesser recommends small doses of salvarsan (0.1 gm. in oil of sweet almonds) injected once a week until the Wassermann reaction is negative. Spiethoff advises intravenous injection, followed four days later by subcutaneous injection and a month later by a second intravenous injection. Kromayer has the best results with intramuscular injections of 0.2 gm. in paraffin oil, given every other day for six doses and followed by mercurial treatment. Benario advises one maximum dose intravenously followed by mercury, and later by another intravenous injection. The usual dose in most of the European clinics is 0.5 gm. for patients of average vigor. In the strong with malignant lesions, Ehrlich thinks as much as 0.8 gm. may be given with safety in a single dose. The debilitated, and especially those suffering with nervous troubles, should not be given over 0.4 gm. as the initial dose. The larger doses have been found most effective in primary and secondary lesions, while the tertiary manifestations and malignant forms seem to yield best to repeated smaller doses.

As to the therapeutic value of this new treatment, there is an almost unanimously favorable opinion on the part of all men who have tested it clinically. That Ehrlich has attained his object, i. e., *therapia sterilans magna*, is still an open question, but that he has rendered one of the

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.

greatest services to humanity is universally admitted. Dr. Zwick in his review of the literature of this subject says: "All reports unanimously attest, as a rule, syphilitic manifestations of every kind and stage are promptly and favorably influenced. Exception to the rapid and favorable action of the new medicament have, however, been noted, but their number is small. The general opinion at the recent important meeting of the scientists at Königsberg appeared to be that 606 had wonderful effect in tertiary and primary syphilis and acted well in secondary; especially active in malignant and advanced cases. Does not affect the eye, large doses cure in one dose in the early stages, permanency yet to be proved."

The relation of the salvarsan treatment to the Wassermann reaction has received a great deal of attention in Europe. Most observers agree that the reaction does not change from positive to negative immediately, nor does this change occur always as soon as the symptoms have disappeared. The reaction may become negative soon after the administration of salvarsan, and again become positive after the immediate sterilizing effect of the arsenic has spent its energy. Repeated doses, however, have been found to render the reaction permanently negative, so far as have been observed in ninety per cent. of cases. As in the use of vaccine, it was essential to determine the opsonic index in a large number of cases before the best methods of administration, the dosage and clinical value of the opsonic index could be estimated, so now every case of syphilis, before receiving salvarsan, should be tested for the Wassermann reaction, and such tests must be made for several months after treatment is discontinued, if we are to arrive at definite conclusions as to the permanency of this new treatment.

As regards the dangers of the salvarsan treatment, a number of fatalities have been reported by European experimenters, but Ehrlich, after a careful analysis of these cases, claims that death could not justly be ascribed to salvarsan except in one instance. In the reported cases, he concludes that death was due to severe lesions which would have resulted fatally without treatment. Ehrlich warns against the use of the drug in cases of serious heart lesion or those showing evidence of degeneration of the nervous system.

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## THE ABORTIVE TREATMENT OF SYPHILIS.\*

By HOWARD MORROW, M. D., and L. S. SCHMITT, M. D., San Francisco.

As soon as it became evident that salvarsan would not effect a cure in all cases of syphilis, it was logical to turn towards a combination of this drug with mercury to obtain the desired result.

Numerous cures by the use of salvarsan have been reported but many of them will not stand the test of time or close investigation. All of us have seen patients with early manifestations of lues to whom salvarsan has been given, and in whom there has been a return of syphilitic lesions. This is usually seen in patients who have received but one intravenous injection of salvarsan, and seldom occurs when mercury is given in addition.

Nichols (*Jour. Exp. Med.*, 1911, xlv, 201), has shown that in animals the relation of the "curative" to the lethal dose of salvarsan is greater than the difference between the "curative" and lethal dose of mercury.

Our experience with the serum reaction bears out Craig's (*Arch. Int. Med.*, 1911, vii, 395), contention that a negative reaction is obtained quicker and with fewer relapses where mercury is administered in conjunction with salvarsan.

Arning (*Deut. Med. Woch.*, Sept. 28, '11, 1792), reports 71 patients treated with salvarsan (45 with primary syphilis and 26 with secondary syphilis), having no symptoms and a negative serum reaction after eleven months. One patient with a primary in November, who became free of all manifestations and with a negative serum reaction, was reinfected in the following February.

Klausner (*Munich Med. Woch.*, Oct. 31, '11, 2335), reports a reinfection after salvarsan, and Schreiber (*Munich Med. Woch.*, 1911, 893), reports three more cases following similar treatment.

In these cases it can not be controverted that syphilis was aborted by salvarsan alone. Such cases of undoubted early reinfection were unusually rare when mercury was used as the only means of treatment.

In some instances the appearance of constitutional symptoms has been prevented by the use of even a small amount of mercury administered early. But these cases are not numerous and frequently relapse after the mercury is stopped.

Frequently mercury administered for weeks or months after the appearance of the initial sclerosis has failed to prevent the appearance of skin or mucous membrane lesions. It is further true that cases which are not influenced by mercury at once improve by the combined treatment.

That salvarsan alone acts directly on the treponemata is shown in three of our cases (Nos. 4, 5, 6). Numerous treponemata were demonstrated with the dark field condenser before treatment, yet none were found twenty-four hours after the administration of salvarsan. These facts have also been borne out by animal experimentation.

Patients infected with *treponema pallida* can be divided into two classes. First those with a

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.



mild infection, strong resistance, or short period of incubation, are easily sterilized by therapeutic measures. And secondly patients in which the treponemata have found their way into localities not so easily reached. To the first class belong those cases in which lues can be the more easily aborted, either by salvarsan alone or combined with mercury.

If by reason of the virulence of the infection, the length of time elapsing before treatment is begun, or a lowered resistance of the patient, the treponemata find their way into the less accessible localities, complete destruction of the treponemata is extremely difficult. Any one who has noted the circumscribed localization of the treponemata and how they apparently seek the denser histological tissue will realize at once the difficulty of destroying them. As examples recall the marked resistance of luetic bone lesions to treatment, and the vigorous therapeutic measures demanded in hereditary lues.

More recently the work of Noguchi with the luetin skin reaction shows the necessity of beginning therapeutic measures early. Therefore early, rapid, and intense treatment is necessary. Rapidity of action is best obtained by salvarsan, and intensity and penetration, by mercury.

Salvarsan acting alone fails to reach the treponemata in the interstitial tissues, while mercury alone by its slower action, allows the treponemata to reach the less vascular areas. Acting together these drugs are able to reach a greater number of treponemata than either one acting alone.

The following is a list of patients with early lues in whom we believe the progress of the disease has been stopped:

We would suggest the following as a general course of procedure in early lues:

Excision of the chancre, if the treponemata are numerous, infiltration dense, and the neighboring glands not markedly enlarged; .45-.6 grams of salvarsan should be given intravenously as soon as the diagnosis is made, and invariably repeated in one week if secondary manifestations have begun to appear. This should be followed by at least one course of mercury given by means of inunctions or injections. The presence or absence of clinical manifestations, together with the serum reaction must decide whether the procedure should be repeated.

The present standard of the so-called cure of syphilis consists of a lapse of one year after cessation of the treatment without clinical manifestations and repeated negative serum reactions.

We feel safe in concluding that in the light of our present knowledge early syphilis can be aborted and that the combined method of treatment will best accomplish this result.

A lapse of years without manifestations, with continued negative serum reactions and the absence of the so-called para-syphilitic conditions will alone prove the present contentions.

	Clinical conditions.	Serum reaction before treatment.	Treatment.	Serum reaction after treatment.	Results.
1 1 M. A. C.	Primary of eye-lid. Roseola, Adenopathy.	Positive.	Salvarsan in Apr. and June, 1911. Followed by mercury.	Negative.	No manifestations. Serum negative.
2 2 F. S.	Early lues with roseola.	Positive.	Salvarsan in April, 1911.	Negative two months later.	No manifestations. Serum reaction remains negative.
3 3 E. M.	Early lues with roseola.	Positive.	Salvarsan in June and August, 1911.	Negative.	No manifestations. Serum reaction remains negative.
4 4 D. P.	Chancre duration 1 week. Treponemata numerous.	Negative.	Salvarsan in June, 1911. Followed by mercury.	Remained negative.	No manifestations developed. Serum reaction remains negative.
5 5 M. R.	Primary of 8 days duration. Many treponemata.	Negative.	Salvarsan in Feb., 1911. Followed by mercury.	Serum positive 10 days after Salvarsan. Negative 24 days after.	No manifestations developed. Serum reaction remains negative.
6 6 O. R.	Chancre of 9 days duration. Many treponemata.	Positive.	Chancre excised. Salvarsan April, 1911.	Became negative May, 1911.	No manifestations developed. Serum remains positive.
7 7 J. G.	Primary of 6 weeks duration. Roseola and adenitis. Treponemata present.	Positive.	Salvarsan in June and Aug., 1911. Followed by mercury.	Reaction negative after second injection.	No manifestations developed. Serum remains negative.
8 8 S. H.	Early lues. Papular eruption.	Positive.	Salvarsan in Mar., 1911. Followed by mercury.	Serum negative 7 days later.	No manifestations developed. Serum remains negative.
9 9 H. B.	Primary and early adenitis.	Positive.	Salvarsan in Dec., 1910. Mercury was also given.	Negative 2 mos. later.	No manifestations. Serum remains negative.

## SALVARSAN VS. MERCURY.\*

By VICTOR VECKI, M. D., San Francisco.

The experience medical science has had with mercury extends over centuries and still we do not know all about what it could do. With salvarsan we are just flirting; and while the literature on the subject has already become enormous, and while some syphilologists have had the occasion to employ the arsenobenzol in a great many cases, the experience of the most emphatic, of the most enthusiastic, and of the most eloquent supporters is limited at least in regard to time.

At present we must listen to the experience of those in whom we have faith, but each of us may be excused if he simply refuses to believe anyone but his own eyes. The results obtained are sometimes so startling that we must also excuse the early Berlin investigators who were such splendid promisers, their experience, however, must guard us against expecting too much.

Without delving into the literature and utterly disregarding other investigators' experiences I shall now simply outline what I was able to learn from the use of salvarsan in my cases.

The number treated by me is only 68, in no case was the injection given more than three times. The results were mostly good. Really excellent, almost startling results were obtained in five cases, little benefit in nine and no benefit at all in six. Out of each of these groups I shall outline one or two characteristic histories.

A saloonkeeper, 40 years old, heavy drinker, paid no attention to his infection until in the 9th week of the disease his mouth and pharynx were in a frightful condition, the patient unable to swallow anything. Then he sobered up because the liquids could not be taken by mouth any more. He was told by a customer of his saloon that he should have a Wassermann made, as that would cure him. The united efforts of the physician and of his wife, who in the meantime had developed a beautiful roseola, succeeded in persuading him that no Wassermann was necessary, and he was given an intravenous injection of salvarsan September 7, 1911, at his home, because he refused to go to a hospital. The result was almost marvelous, the symptoms on penis, skin and fauces were disappearing in a hurry, the man was able to eat on September 9th and hardly a trace of the disease was visible on the 11th. The patient so far, has not resumed heavy drinking, but managed, as the wife reported, to come home once in a while in a somewhat hilarious condition, so he did not become a teetotaler. No Wassermann was made because patient refuses, claiming he is well.

But is he?

His wife, 37 years of age, received so far, an intravenous injection of salvarsan at the beginning of the treatment, followed by 48 sublimate, 8 calomel injections, and another intravenous injection of the 606 and still has symptoms of syphilis, slight, but unmistakable clinical symptoms.

A chauffeur, 24 years old, was seen November

4, 1911, with violent secondary symptoms, received an intravenous salvarsan injection November 7th. This had a rather modest influence upon the cutaneous symptoms, a very good one, however, upon the symptoms in the pharynx. He was then given 9 weekly intramuscular injections of hydrargirum salicylicum, after which the skin cleared. He then neglected his treatment, developed again slight cutaneous symptoms, patches in the mouth, violent headaches, claimed that he had no time for treatment, was given kalium iodatum, but as symptoms did not disappear, found time to take 8 further injections of the salicylate of mercury and is clean at present.

A boy of 20, a Russian Jew, with a typical maculo-papulous syphilid (I emphasize his extraction, because we know that amongst the Russian Jews syphilis is frequently malignant, and mostly tenacious), was given March 5th an intravenous injection of salvarsan; up to March 12th the syphilid was blooming most beautifully; injections of hydrargirum salicylicum were given, patient is rapidly improving.

A blacksmith, 40 years old, with hardly perceptible symptoms of ten years old syphilis, and a strongly positive Wassermann, was given an intramuscular injection of arsenobenzol April 25, 1910; most disagreeable pains developed on the 5th day after. Patient who went to work three days after the injection, had to return to bed, and was unable to follow his occupation until the 12th day after the injection. August 4, 1911, the Wassermann was still positive (+), and August 5th he was given an intravenous injection of salvarsan. Patient thought now that he was well and did not return until February 12, 1912, when the Was-

+

sermann was —. February 15th he received another intravenous injection and March 11th the Wassermann was negative (—).

A waiter, 35 years old, was infected in 1905 and received thorough mercurial treatment at my hands and after our earthquake-fire, by Kreissl of Chicago to whom I referred him. March 20, 1911, he presented himself again with slight cutaneous symptoms, was given May 31, 1911, an intramuscular injection of salvarsan which disabled him from work for 3 weeks, but made all symptoms disappear. November 10th Wassermann was positive (+), 12 daily injections of sublimate were given and 6 weekly injections of salicylate of mercury. Wassermann 3 months later was negative (—).

A clerk, 42 years of age, with a complicated history of luetic troubles of many years, involving various attacks of partial paraplegia, with incontinence, aphasia, spells of stupor and hebétude, and who consulted me in 1904, was restored to usefulness by persistent calomel injections, having worked ever since the early months of 1905, was taken April 29, 1911, suddenly ill again. I saw the patient early in the morning and had him removed at once to the hospital. He was perfectly unconscious and comatose, incontinence of urine and feces, inability to swallow anything. An intra-

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.

muscular injection of salvarsan was given, the patient knowing nothing about it; 24 hours later he was perfectly conscious and recovered fully in a few days. He is still working. I am sure that in this case nothing but a salvarsan injection would have saved the man.

A working man, 33 years old, covered with a papulo-squamous roseola, was given an intramuscular injection of salvarsan March 21, 1911. Twelve days later the roseola was barely visible, patient was given 8 injections of calomel and 8 injections of the salicylate of mercury. No symptoms since.

A merchant, 42 years old, with a history of syphilitic symptoms for 15 years, treated by Fournier in Paris and many other noted syphilologists in Europe and this country, came to my office March 16th in a most pitiable condition. An enormous gumma of the tongue causing intense and continual pain, inability to swallow, was making life unbearable. The large doses of kalium iodatum he was taking seemed to have no influence. He claimed that he was given a subcutaneous injection of salvarsan four weeks ago, that his tongue improved considerably soon afterwards, but that he would have no more salvarsan injections. His reasons were that the pain caused by the injection lasted for weeks, was worse than that from the gumma, and the improvement in the gumma did not last longer than the pain from the injection.

The patient was placed in a hospital. The first night the pain was so intense that two hypodermic injections of  $\frac{1}{4}$  gr. of morphine brought only temporary relief. Under the influence of aspirin and local medication the patient improved considerably and having now more confidence, submitted March 24th to an intravenous injection of salvarsan. The next 4 days the gumma seemed to be melting away, the patient became able to take various forms of food, and had very little pain. But on the 6th day after the injection the pain radiating from the gumma into the head became very intense again, and while the gumma itself was constantly improving the cervical glands did not subside and became rather more painful and more sensitive to touch. A second intravenous injection of salvarsan was given April 1st. The healing process in the gumma kept on progressing rapidly, but the cervical glands did not decrease, the patient was in constant pain. April 5th daily injections of sublimate were started. The swelling of the glands began to decrease 48 hours after the first injection and kept on doing so constantly, the pains diminished rapidly, and the patient is at present in a comfortable condition.

While my experience with the remedy may be called limited, I venture to claim the advantage that all cases, with the exception of three, who simply disappeared, were under absolute control and carefully observed, and as personal experience is for everybody the most convincing I take the liberty of drawing the following conclusions:

1. Salvarsan, used cautiously but energetically is a powerful antisymphilitic remedy.
2. The intramuscular injections are more ef-

fective and give more lasting results, but are almost impracticable on account of the frequently ensuing pain, and other bad consequences.

3. Salvarsan alone may be able to cure syphilis, it does it, however, in exceptional cases only, and even in those we very seldom can be sure of it.

4. The combination treatment, advocated at present by many investigators, also by Ehrlich himself, will in all probability shorten the time of the necessary treatment.

5. It is very hard to judge of the relative value between salvarsan and mercury. Salvarsan surely has its charms and allurements. But, plainly speaking: if I had to abandon one of the two remedies it surely would not be mercury.

### THE FALLIBILITY OF SALVARSAN.\*

By LEON JOSEPH ROTH, M. D., Los Angeles.

In considering salvarsan from this point of view, we do not wish to be understood as being in any manner opposed to its judicious use, or not cognizant of its efficiency as a strong therapeutic factor in the treatment of lues. The present prevailing opinion that it is not the sterilisans magna is apparently exact, in spite of the fact that an occasional case is reported as being cured by a single injection.<sup>1</sup> These few cases are substantiated by the reporters as having had a second initial sore after the lapse of from six to twelve months. These reports are not conclusive, because while we acknowledge the possibility of reinfection, the authors have not demonstrated that their cases were followed by the usual secondaries. Also we must recall that years ago Fournier<sup>2</sup> maintained that the spontaneous cure of syphilis was possible; and further, what may seem to be a typical recurrent lesion, may be only a chancre de recidive—a chancriform syphilide appearing usually at the original site of infection, or perhaps elsewhere.

Concerning the vulgar usage of salvarsan we may go to the extreme, and say that on account of its unreliability in producing definite and permanent results, and preventing even early recurrences of symptoms and lesions, it alone is a menace, because it leaves the ignorant and unwarned to exist in a false security, that may lead to their destruction. In spite of this a multitude of administrations are made daily by the regular and irregular practitioner, with the assurance in many cases, that a single injection is sufficient to cause a disappearance of any lesion and the easy conviction of the victim that he is to be entirely and forever cured.

Commercially, salvarsan is a great success. Therapeutically, its value lies in its skilled administration in chosen cases, where no contra indications exist, and lesions or symptoms present that require a rapid, intensive treatment, as a preliminary to subsequent medication by similar substance, and more than likely by mercury.

It is an exceptional instance to find a really curable case that fails to react to appropriate

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mercurial treatment, and by appropriate mercurial treatment, we do not mean merely the use of a few injections of bichloride or salicylate, but a mercurial treatment instituted with preparations sufficiently powerful to produce results, and given in an energetic, and not semi-experimental manner. We frequently see reports wherein is mentioned as a fact that "mercurial therapy failed but salvarsan produced miraculous results." This we do not believe to be absolutely true, because we are convinced that many of these authors do not sufficiently understand this form of mercurial administration and if one preparation or another fails, they are prone to abandon that metal entirely.

The enthusiasm concerning the rapid healing and disappearance of the various syphilitic manifestations is to a great degree unwarranted.

In primary lues the young simple initial lesions do not heal very readily; exceptionally in less, it usually taking from 20 to 25 days to cause their obliteration, and this period will not include the time necessary to cure the more complicated forms, such as those with great induration or phagedenism. Reports are frequently made that a chancre will heal in from 2 to 8 or 10 days. This is true, but the reporters of these cases apparently lose sight of the fact that they have inaugurated a campaign against an already aged lesion.

The tendency of most primary and secondary syphilides is to spontaneous disappearance, the rapidity of which depends upon the character of the lesions; for this reason, even under treatment the time necessary to cure will vary.

As an illustration opposed to a previous statement, one author<sup>3</sup> reports that it required 40 days' time and 5 intravenous injections of salvarsan of .60 gm. each, to cure a chancre of the coronal sulcus; and this lesion was not of recent origin.

The persistence of primary adenopathy is notable, even after plural injections; it frequently taking 3 months and longer for these to disappear; and a curious feature occasionally observed is the development of small painful servical glands following an administration.

Of the secondary syphilides, the ordinary roseola and mucous patches are quickly enough influenced by a single injection, but unfortunately, occasionally rapid in their recurrence. It is not uncommon to see a relapse even as early as the seventh day. The rapidity of effect on the papular rashes depends upon whether they are of the ordinary or hypertrophic forms. The papulo-erosive type is most amenable, and to a slightly less degree are the vegetating and secondary ulcerous varieties. The extraordinary syphilides, such as the papulo-lenticular, the miliary, the lichenoid and psoriasiform of the palmar and plantar surfaces are rebellious to treatment and take 2 or 3 weeks or longer to fade, and frequently require more than one administration.

Pigmentary syphilides of the neck are neither affected nor prevented. Alopecia is not greatly

influenced; a satisfactory re-growth of the hair is not usually seen before two months.

Cephalalgia and the ostites disappear with rapidity, but not more quickly than if treated by gray oil; even a single injection suffices, providing adequate doses of potassium iodide are given in conjunction.

The different forms of onyxes are very slow in succumbing; the dry, brittle variety showing the greatest tendency toward recovery.

In precocious malignant lues, the ulcerous lesions co-existing with gumma were cured in from 15 to 20 days, according to Nicolas and Mutot (3a) who consider this a veritable triumph for salvarsan. Five of their seven cases remained healed during the time the patients were under observation; the lesions persisted in the other two. The authors do not state how long.

Generally considering secondary symptoms of the eye, nose and throat, the immediate results of treatment are uniformly good, my informants stating, however, that practically all of their cases were too recent to insure them against the possibility of recurrences, and that the affections of the eye were the least prompt and stable in becoming influenced. In a now rather ancient statistic, Feb., 1911, Stuelp<sup>4</sup> reports a collection of 470 miscellaneous eye cases treated by one injection only, with no results in 35%.

Of the tertiary lesions, the scleroses and leucoplasiae are not modified. Gummatous, ulcero-gummatous and ulcero-crusty manifestations respond to treatment in direct proportion to the extent of their destruction. Potassium iodide, being always indicated, influences to a great extent, the specific action of salvarsan. We have not used this preparation in pulmonary or visceral syphilis, mercury having always responded to the demand made upon it, and for the same reason, we have had no experience in hereditary lues.

Considering the para syphilides—an occasional tabes shows improvement. Among other cases may be mentioned those of Pedersen and Hayden.<sup>5</sup> The latter mentions five cases in which the immediate results were brilliant, but that at the end of a few weeks there were recurrences of symptoms, which subsequent injections did not benefit. In three personal cases, the painful crises (gastric and lightning pains) were relieved in only one instance, in this case an ancient plantar syphilide—porokeratosis—was made to disappear. The other two, with one injection each were in no way improved, and one of these had the most severe crisis in his experience two days after his treatment.

The cases in which ameliorations occur, or in which comparative recoveries are noted, must be studied from a pathologic point of view. Whether these are due to scleroses of the posterior columns, to the development of a low grade of localized spinal meningitis, gumma, or to the various forms of arteritis, remains, of course, unknown. It is reasonable to accept any of the latter causes, knowing of their greater or less susceptibility to

any intensive appropriate anti-syphilitic medication, and reject the former on account of the impossibility of regeneration of central and spinal nervous structure. To illustrate: several years ago we had an avowed syphilitic under observation, who presented the classical symptoms of tabes; he was put under a treatment of protoiodide pills and iodide of potassium, with the result that all the ataxic symptoms disappeared, and have not returned to this day. In tabetic cases then, salvarsan, or any treatment is indicated only if a positive Wassermann is developed and active syphilitic symptoms exist.

There are no exact results in hemiplegia and paraplegia, and the treatment of paresis is always a failure.

This compilation does not include all of the symptoms and lesions of syphilis; it merely contains certain varieties upon which the action of salvarsan has been accurately demonstrated. Because certain lesions disappear rapidly and treponema are destroyed in a few days, the claim is not warranted that the disease is eradicated.

One of the most energetic French writers<sup>6</sup> states: "We have often noted recurrences after single or plural injections; further, the results of the serum reaction are not constant, and positive reactions are frequently obtained even after three doses of salvarsan. What we may say is that if an intensive treatment is instituted, for instance, three intravenous injections of high dosage, all given within a period of 3 to 4 weeks, we have not after 5 months seen any recurrences."

Stoker,<sup>7</sup> reporting 700 intravenous injections, says that the duration of the treatment should be intermittent for 3 or 4 years. Neisser<sup>8</sup> advises that it be continued for months and years, until all syphilitic symptoms disappear permanently, and a permanent negative Wassermann reaction is obtained. He is not prepared to say what is the therapeutic and prognostic value of the Wassermann, and maintains that salvarsan has complicated the treatment of lues.

It does not follow that certain cases may not receive but one injection, and that intramuscularly, and remain free from recurrence even after a year; but we cannot feel secure, considering the vagaries of the serum reaction, in honestly assuring our patients, at least up to the present, that they are free from infection, and permit them to take on such a responsibility as marriage.

What can be hoped for the recipient of salvarsan, if one injection only is considered sufficient in certain cases, and plural injections are necessary in others? In the commerce of medical practice, we would not dare to tell any one private patient that perhaps from 5 to 10 injections may be necessary to cure him. This might do in institutional work, where heroism is more casual than riches.

In résumé then, we agree that arsenobenzol has its field of usefulness, that in certain cases it gives surprisingly good results, that its most potent action is upon lesions in active evolution,

and that in some cases it surpasses mercury in rapidity of effect.

But we contend that alone it has not positive curative power, because sufficient time has not elapsed to prove its permanent efficacy; and recurrences of symptoms and lesions seen after one, may well be seen after plural injections. It has not positive abortive action, and further the inconstancy of the sero-reaction makes of it an enigma, the solving of which will perhaps be perceived in the future.

In any case we are not authorized to consider a patient definitely cured. The mercurial treatment, methodic, intermittent and prolonged, should always be instituted after arsenobenzol. Under the existing circumstances, it can neither exclude nor replace the former.

In conclusion we suggest that it is the duty of the profession to enlighten the laity, and protect them by conscientious advice, and truthful facts.

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### SALVARSAN IN VARIOUS MEDICAL DISORDERS ASSOCIATED WITH A WASSERMANN REACTION.\*

By WILLIAM FITCH CHENEY, M. D., San Francisco.

It is the object of this paper to review the cases seen in the Medical Wards of Lane Hospital between January 1, 1911, and April 1, 1912, where a Wassermann reaction was present and salvarsan was given. For keeping the records of these patients much is due to the assistance of Dr. P. H. Luttrell, to whom acknowledgment is herewith gratefully made. To call these cases visceral syphilis is not altogether accurate, because they include manifestations in structures not correctly defined as viscera; and because even where viscera seemed involved none of these patients came to autopsy to confirm the suspicion. The cases observed and herewith presented number 51 in all; but many of these had salvarsan more than once, so that the total number of injections considerably exceeds this figure.

In classifying these, the largest group, as might be expected, has been that involving the nervous system. In this there have been 23. These neurological cases with Wassermann reaction have been studied especially by Dr. W. F. Schaller, who has taken up their consideration in detail in a separate paper; and they will therefore not be dealt with in this. Suffice it to say that they include affections of all parts of the nervous system—brain, spinal cord and peripheral nerves.

The next largest group has been that where the diagnosis made by patients themselves has been

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rheumatism; of such cases there have been 9. These patients have complained especially of pains in joints, or in bones between joints, or in muscles and fasciae; these pains persisting for months or for years, but usually without visible evidence on examination, of redness or swelling or alteration in contour; though often there was tenderness or stiffness on moving the joints or limb of which complaint was made. In one case there was found a hydrops of the knee, the fluid aspirated as well as the blood from the arm showing the Wassermann reaction. In two cases there was a history of chronic gonorrhea as well as of lues, and the suspicion of gonorrheal arthralgia was strong enough to prompt the use of gonococcic vaccine; but in each case the greater relief seemed to follow the injection of salvarsan. These pseudo-rheumatic patients all claimed to be greatly benefited by the salvarsan; though in several the pains recurred after a variable interval and the injection had to be repeated.

Next in frequency come the cases where the complaint was of stomach trouble. Out of the large number of patients with this story to tell, there were five who gave the Wassermann reaction. In two of these it was possible to demonstrate the existence of *tabes dorsalis* and to classify the "stomach trouble" as gastric crises. In both of these stomach analysis showed hyperchlorhydria and in one of them a persistent hypersecretion. Salvarsan gave both much relief. Two of the other cases, without evidence of *tabes*, likewise had hyperchlorhydria to explain their gastric symptoms; while the remaining one was clinically chronic gastritis with subacidity. It is impossible in such cases to conclude, simply because a Wassermann reaction is coincident, that syphilis is the cause of the symptoms; and as salvarsan accomplished no permanent benefit in any of the three, the best proof is afforded that some other cause existed. The chronic gastritis case was given this remedy on November 3rd with no improvement following; again on November 27th with temporary improvement; but in March, 1912, he was back again with all his old symptoms and a triple X Wassermann in spite of his two injections; so a third was given on March 20th. One of the hyperchlorhydria cases had a tender appendix that was probably the source of his dyspepsia. Salvarsan gave him only temporary relief, probably subjective. The other case was not at all relieved by the injection, though the Wassermann reaction subsequently became negative.

Cases of intestinal trouble have been more infrequent and only two have been seen with coincident positive Wassermann reaction. One of these was an obstinate constipation of several months' duration with no discoverable abnormality in abdomen, rectum, stomach contents or feces. After salvarsan he undoubtedly improved in a remarkable way, his bowels moving regularly without laxatives or other aid. The second was a case of dysentery, with pain in the left side of his abdomen and mucus and blood in his stools at intervals for over a year; with visible ulcers just beyond the internal sphincter; no amebae in his feces, nor tubercle bacilli; but

a positive Wassermann reaction. After salvarsan his ulcers healed, his symptoms all disappeared and he left the ward perfectly well.

As regards the liver, which is supposed to be a frequent sufferer in chronic syphilitic infection, we have had but two cases where the symptoms and signs pointed to this organ and where the Wassermann was found. One of these presented a rather characteristic history of chronic gall-bladder disease, with recurring attacks of colic and jaundice; after salvarsan, her long-standing symptoms all disappeared, but whether permanently remains to be seen. In the other case, with deep jaundice and a greatly enlarged smooth liver but no pain, salvarsan given twice has so far produced no effect and it seems probable that the disease is malignant, and not explained by the blood reaction for syphilis.

The respiratory system has only twice presented symptoms coincident with Wassermann reaction. One case ill for two months with hoarseness, cough and loss in weight suggested tuberculosis; but the lungs were found normal and the sputum showed no bacilli; while the larynx showed diffuse infiltration of the whole mucous membrane, hyperemia of the cords and the right cord swollen and indurated; and the blood showed a positive Wassermann. After salvarsan there was decided improvement in his voice, his general health and his larynx. The second case complained of chronic cough and expectoration and his chest presented the signs of chronic bronchitis; after one injection of salvarsan his condition improved remarkably in every way, he lost his cough, gained in weight, and his Wassermann reaction became negative.

It is rather surprising that we have seen but two cases of disease of the circulatory system, with coincident Wassermann reaction. One of these presented the clinical picture of general arteriosclerosis with myocarditis and broken compensation. Salvarsan was given him but once and then in half dose, because the condition seemed too critical to warrant more; no effects either good or bad followed, that could be attributed to the injection. The other case was one of aortic regurgitation with broken compensation and extensive dropsy. He was never given salvarsan because too ill to justify it; and his case is therefore not included in the number reported.

Of the remaining cases, various clinical manifestations were associated with the Wassermann reaction; in one an extensive stomatitis and glossitis, cured promptly by one injection; in one, multiple recurrent boils, also much improved after salvarsan; and in two, chronic disturbances of the eyes, with conjunctivitis, iritis and retino-choroiditis, improved but not cured after treatment.

Infectious fever: As syphilis belongs to the group of specific infectious diseases, it is not surprising that at times it presents a fever course and symptoms that make it resemble other more acute infections. In such cases the Wassermann reaction may or may not be of aid in differential diagnosis; for on the one hand it may be absent even though the symptoms are due to syphilis; and on the other, it may be present even though the symptoms are



due to some other coincident infection. In illustration of the difficulties about deciding what a negative or positive Wassermann reaction really means, the great good that salvarsan may do if indicated and the uselessness or even harm in its administration if not indicated, the three following cases have seemed the most interesting of all we have to present, and are therefore described in detail.

Case 1. A man, age 42, a laborer by occupation, was admitted February 24, 1911, complaining of headache and no appetite, for two weeks previous with gradually increasing weakness and loss in weight. He admitted gonorrhea but positively denied syphilis. On admission his skin showed no eruption except slight acne over his back. His throat was reddened, the posterior wall inflamed and covered with mucus but the tonsils were not enlarged and there were no deposits or ulcerations. No abnormality was found in his lungs, heart or abdomen; no enlargement of liver or spleen; no enlarged lymphatic glands; no edema of extremities or scars. His temperature from the beginning was slightly elevated, from  $99^{\circ}$  to  $101^{\circ}$ .

Gradually during March he developed enlargement and bogginess of the tonsils, and increased inflammation of the throat, with ulcers on the pharyngeal wall, the pillars of the fauces and both tonsils; all of them covered by a whitish membrane, all raised and irregular and with granular surface, and all very painful and tender. The laryngeal mucous membrane likewise became infiltrated, edematous and reddened; with several pinhead-sized yellow areas resembling tubercles. During the development of these throat lesions the temperature pursued a low course, at times normal in the morning, rarely rising above  $101^{\circ}$  in the evening and never above  $102^{\circ}$ .

But by the beginning of April, coincident with extensive ulcerations and membranous deposit in the throat, the temperature became continuous at a higher level, averaging  $101^{\circ}$  to  $102^{\circ}$ , without morning remission and with occasional evening rise to  $103^{\circ}$  or  $104^{\circ}$ . The pulse rate likewise gradually rose from normal until it averaged 120. At this time also the patient developed a general skin eruption. The clinical note made on April 3rd says: "Over forehead, cheeks and chin there are numerous discrete papules and pustules and a few macules; the eyelids are reddened, thickened and bathed with a sero-purulent discharge; the ocular conjunctivae are slightly injected; each nostril is reddened and inflamed and partially occluded by purulent discharge; the lips are pale, both are swollen and the lower lip shows several of the maculo-papular lesions seen elsewhere on the face; the breath is very offensive, the tongue heavily coated; the roof of the mouth shows numerous reddened, infiltrated areas, like purpuric spots; the teeth are decayed, several are missing, all show abundant thick deposit at the junction of the gums; both tonsils and the posterior wall of the pharynx are completely covered by a grayish-yellow deposit; the expectoration is profuse, viscid and bloody; cervical glands are moderately enlarged on both sides; over right forearm and arm there are numerous discrete lesions resembling those on the face, except that more of them are macular and on the forearm they are distinctly purpuric in character; over the left forearm and extending half-way between elbow and shoulder there is a diffuse blotchy, purpuric discoloration; between the elbow and shoulder several discrete maculo-papular lesions are seen; the right hand shows numerous macules, and the right wrist is stiff and painful; the left hand is swollen, edematous and the fingers and wrist are likewise stiff and painful, with a few macules found on the dorsum of the hand; over both lower limbs numerous purpuric spots are found, but discrete and

scattered and nowhere confluent; no skin lesions are found at this time over the trunk, except a few fine spots in each axilla, no abnormality is found in lungs, heart or abdomen, except that the area of liver dullness measures 14 cm. and that of the spleen 7 cm."

During April the patient's general condition grew steadily worse; his temperature and pulse rate ranged persistently high, and he lost rapidly in weight and vitality. The throat condition showed no improvement. The skin lesions gradually developed into large pustules, thickly scattered over both sides of the face and scalp, the ears and neck, both arms, both legs, the back and the upper part of the trunk; they varied in size from a pea to a half dollar; all had thick crusts, "piled up" like the classical rupia.

The effort to identify the nature of this patient's illness caused much investigation by various men in the hospital ward and laboratories. It was clear that he was suffering from some chronic infection, the only question being as to its character. At the outset, diphtheria was the first thought, but this possibility was soon eliminated by cultures from the throat. The next hypothesis was that of streptococcus infection, a theory that seemed to be proven when streptococci grew in the cultures from throat swabs; but anti-streptococcal serum given twice in the latter part of March had no effect, except perhaps to cause some of the purpuric eruption and the joint pains that developed soon afterwards. Tuberculosis of the throat was eliminated by the persistent failure to find tubercle bacilli in the sputum or in swabs from the ulcerated surfaces. Glanders seemed a very likely explanation of the naso-pharyngeal lesions, the fever, the skin eruption and the arthritis; but throat cultures and blood cultures and cultures from the pus underneath the crusts on the skin all failed to show the characteristic organism; injections of guinea pigs were likewise without diagnostic results; the injection of mallein gave no reaction; and it was thus at last found impossible to verify the suspected diagnosis of glanders.

At the outset and as the case developed, syphilis seemed a most likely explanation of the fever, the throat condition, the tender joints and especially the skin lesions. But the patient insistently denied this possibility; and furthermore, what seemed particularly conclusive, the Wassermann reaction was negative, not only once but on three different occasions during the course of the investigation. Nevertheless, as the patient steadily grew weaker and more emaciated and his death seemed inevitable; and as no other diagnosis had been established as a basis for treatment, it was finally concluded to give salvarsan anyway, on the clinical evidence, in spite of the negative Wassermann reaction. The first dose, .6 gram was administered intravenously on May 15th. Within twenty-four hours the temperature fell from  $103^{\circ}$  to  $99^{\circ}$ , and never again went above  $100^{\circ}$ . The patient at once improved, both subjectively and objectively and in a way that seemed almost magical. The large pustular crusts on the skin dried up and fell away; the mouth and throat became clear; the appetite returned and the patient began to gain in weight. Ten days after salvarsan was given, the blood showed a triple X positive Wassermann reaction, conclusively demonstrating the nature of the infection. On June 20th a second dose of salvarsan was given, although the patient then showed practically no signs of his previous illness and was up and walking about the ward. He left the hospital on August 10th absolutely well, strong and fat and ready to return to work.

Case 2. A man, age 23, a laborer, was admitted to the hospital September 23, 1911, complaining of sore eyes, headache, and pains in his legs. He had a history of gonorrhea two years before and again eight months later; and since the second attack a

chronic gleet, with characteristic "morning drop." One year before he had what was diagnosed as soft chancre, that healed up in one week; without any subsequent rash or sore throat or other evidence of disease.

His present illness began five days before, with inflammation of his eyes and watery discharge. The next day headache began in the temporal regions and he had pains all over his body, but principally in his arms, back and legs. On admission his temperature was 102° and fever persisted thereafter, ranging each day from 100° a. m. to 102° p. m. His eyes showed a conjunctivitis, iritis and irido-cyclitis. His tongue was coated. The glands on each side of the neck, in each submaxillary region and each post-auricular region, were enlarged and palpable. There was no abnormality found in lungs or heart. The liver was slightly enlarged and the area of splenic dullness measured 8 cm. The abdomen was slightly distended and distinct rigidity was found in the right side, with tenderness, in the region of the caecum. The urine showed a light cloud of albumen and many leucocytes, but no casts.

The first question that arose was whether this man's infection was by typhoid bacilli, for which the fever, the headache, the enlarged spleen, the distended abdomen and the tenderness in right iliac fossa all spoke. But on the other hand, typhoid would not explain the inflammation of his eyes or his enlarged glands. On blood examination he was found to have 10,000 leukocytes with 75 per cent. polymorphonuclears; the Widal reaction was negative, and blood cultures were likewise negative.

Measles in the pre-eruptive stage might explain all the symptoms, but it seemed that days enough had elapsed since onset for the eruption to appear; furthermore, no other mucous membranes but those of the eyes were involved.

Smears from the meatus urethrae showed gonococci present and the history indicated the existence of a chronic gonorrhea; from which his eyes might have been infected or even a general sepsis might have arisen.

But the real clue to the nature of the infection was furnished by a triple X Wassermann reaction, indicating an active syphilitic process; and on this theory salvarsan was administered on September 28th, five days after admission. The effect was miraculous. In twelve hours the temperature fell to normal and the fever never recurred. The iritis disappeared; the enlarged glands shrank to normal size; the pains in head and limbs all vanished, and four days after salvarsan was given the patient left the hospital, feeling and appearing in perfect health.

Case 3. It was inevitable that two such brilliant successes should cause over-confidence and so lead to disaster. It followed very shortly. On October 24th, 1911, a man aged 46 was seen at the out-patient clinic with a history that for three or four weeks he had entirely lost his appetite, had lost fifteen pounds in weight, his bowels had been very constipated and he had occasional headaches. He had a definite chancre three years before, followed by symptoms that he had been told were "secondaries"; but he was treated for only five or six weeks, by inunctions and medicine internally. On examination he was found to have a coated tongue; liver and spleen enlarged and palpable; a tender mass in the right side of abdomen over the cecum; palpable epitrochlear glands; marked peripheral arterio-sclerosis; numerous scars and several open, bleeding ulcers on both shins. His blood gave a positive triple X Wassermann reaction on October 26th. On admission to the hospital he was found to have a temperature ranging from 99° to 101° each day. On November 1st he was given salvarsan intravenously, without reaction—no chill, no rise of temperature, no nausea or vomiting. On November 3rd at 4 p. m. he had slight epistaxis; this recurred after midnight and became so profuse

that it necessitated packing of the naso-pharynx on the morning of the 4th; even after that persistent oozing continued during the 4th and 5th. On the evening of the 5th he had a copious bloody discharge from the bowel. On the 6th he seemed better and lost no blood; but on the 7th he had several large tarry stools, four in all; on the 8th there were two bloody passages. On the 9th the tarry stools continued; an oozing from the nose recurred; a bloody discharge began from the mucous membranes in mouth and from the gums; and he coughed and expectorated blood. On the 10th bleeding continued from nose, mouth, bronchial mucous membrane and bowel; and on the 11th he had in addition a hemorrhage from one of the ulcers on his leg. This went on until his death at 5 p. m. on the 12th.

As bleeding began and persisted the temperature for the first three days rose slightly, but after that gradually fell; but the pulse rate steadily rose from 100 to 150. As the case progressed the patient became rapidly weakened, with drowsiness, most of the time, involuntary bowel movements, labored respirations and occasional delirium. The urine at the outset was normal in quantity and quality; in the out-patient department before admission and in the hospital after admission, for the first week; then it began to show albumen and a large number of granular casts. The blood became rapidly depleted as the hemorrhages went on. On November 8th the hemoglobin was 20 per cent., the red corpuscles 1,250,000, the white corpuscles 4,800; on November 10th the hemoglobin was 18, reds 1,100,000, whites 6,000. The red cells showed all the evidences of rapid anemia, in poikilocytosis, anisocytosis, and polychromatophilia, with the presence of a few nucleated reds. The coagulation time averaged 10½ to 11 minutes.

The medical therapy, besides the local treatment to the naso-pharynx by packs and astringents, included calcium chloride by mouth; horse serum repeatedly, subcutaneously and intravenously; human blood serum intravenously; normal salt solution under the skin, in the bowel by the Murphy drip, and intravenously; tincture of iron by mouth; strychnine hypodermically; gelatin solution by mouth and by bowel. The patient was seen by practically every member of the medical, surgical and rhinological staffs in the hospital, and every suggestion that offered any prospect of relief was faithfully tried; but all without success.

By those who watched this case the bleeding was supposed to be due to the administration of salvarsan and to no other cause. The autopsy, however, showed all the characteristic pathology of typhoid fever; this was the active disease that had caused the symptoms and the Wassermann reaction was only an incident of the earlier luetic infection. It follows that salvarsan was not indicated in this illness, and it seems highly probable that it really contributed to the fatal outcome.

#### CONCLUSIONS.

*First:* The finding of evidence of visceral disease plus the finding of a Wassermann reaction does not necessarily mean syphilitic disease of the organ giving the symptoms.

*Second:* The existence of chronic syphilitic infection, as manifested by a positive Wassermann reaction, does not confer immunity against any other organic or infectious disease; and any disorder may occur with it that may occur without it.

*Third:* The administration of salvarsan may remove a Wassermann reaction but have no beneficial effect on the patient's symptoms or general condition; in fact, may make him worse instead of better, when these symptoms are really due to some other cause than syphilis.

(The Symposium on Syphilis will be concluded in the October issue.)

## ORIGINAL ARTICLES

## BARANY'S INVESTIGATION ON LOCALIZATION IN THE CEREBELLUM.\*

By KASPAR PISCHEL, M. D., San Francisco.

Though the physiology and the functions of the semicircular canals had been well described by Ewald twenty years ago it was Barany who put the results of these researches to practical use for clinical diagnosis of labyrinth affections. Lately he has gone still further in his research and is trying to solve the question about the functions of the cerebellum. He thinks he has succeeded in localizing the centers for certain movements of the upper extremities. Permit me to cite from a recent address which he has not yet published:

"If in a normal person a horizontal nystagmus to the right has been created either by syringing the left ear with cold water or by turning the patient, with head erect, several times to the left on a revolving chair and stopping him suddenly, there appears besides the nystagmus, a vestibular innervation of almost all voluntary muscles.

"If the patient is asked to walk straight ahead he deviates to the left; in my pointing test he will miss to the left. The pointing test is made as follows: the patient with his eyes closed touches my finger with his index finger. He is then asked to lower his arm and raise it again to my finger. During the nystagmus he will miss to the left. By means of the pointing test it can be proven that the muscles of the head, of the body and of the extremities are all under the vestibular influence. In diseases of the cerebellum (abscesses, tumors, serious meningitis on the surface of the cerebellum) I could demonstrate a lack of these normal pointing reactions.

"In a lesion of that surface of the cerebellum on the right side, which faces the posterior surface of the pyramid, the reaction of the right arm to the left is missing during a nystagmus to the right, while all the other pointing reactions are intact.

"I could prove these facts by the physiological experiment on man.

"The dura of the cerebellum is sometimes exposed in mastoid operations and after the wound is healed it may be covered by a thin skin only, so that the pulsation of the brain can be seen and felt.

"In such cases I could produce a temporary cessation of the reaction to the left of the right arm by cooling the surface just behind the ear. I have made this experiment twenty times with the same result and demonstrated it at several medical meetings."

The one case was that of an eleven-year-old boy on whom a large extradural abscess of the left posterior fossa had been opened. Thin skin only covered the cerebellum. After freezing this part with ethyl-chloride for three minutes the

left arm missed in the pointing test to the left and when nystagmus to the left was produced, the left arm did not miss to the right, while the right arm showed typical missing to the right.

"These cases," writes Barany, "prove conclusively that the center for the innervation of the arm for the inward movement is in the outer upper third of the lower surface of the cerebellum." In the neighborhood, farther in front is the center for the movement in the elbow and wrist.

Numerous observations have let Dr. Barany draw the conclusion that the representation of the muscles is arranged in the cerebellum according to joints and direction of movements. Each direction of movement is represented once, every joint and each muscle is represented in one hemisphere at last four times. Each hemisphere is connected with the extremities of the same side. The practical value of this work has been shown in a number of cases. I will cite the following:

The patient was totally blind; when trying to stand upright fell backwards. Ophthalmic examination revealed papillitis in both eyes, nystagmus to the right and left at the end position; when the head is bent to the left rotary nystagmus to the left; when it is bent to the right rotary nystagmus to the right. Drums appeared normal, hearing normal, sensibility normal. By the functional examination of the vestibular apparatus, respectively of the cerebellum according to Barany's method, a tumor of the cerebellum could be excluded. When the right ear was syringed with cold water enormous nystagmus to the left appeared without dizziness. The patient missed with both arms enormously to the right and fell to the right. When the head was turned to the left he fell forward; a similar result was produced by syringing the left ear. He therefore had found that there was a heightened irritability of the vestibular apparatus and the cerebellum but no cessation of the reactions.

A post mortem showed a large gliosarcoma of the left frontal lobe.

Barany's method of examination in this case prevented the wrong diagnosis.

In conclusion I would like to cite from another paper:

"The spontaneous missing may have two foundations, it can be a sign of irritation or a sign of paralysis. The examination of the functions will show the difference; if a patient misses with the right arm to the right, but misses to the left as long as I artificially cause a nystagmus to the right we have to deal with the symptoms of irritation and not of paralysis (right center); but if a patient misses spontaneously to the right and even during an artificial nystagmus to the right still misses to the right we have to deal with paralysis (left center). In the first case the center is irritated, which produces a missing to the right; in the second case the center for missing to the left is paralyzed, therefore the center for the missing to the right predominates. We may imagine that the movement of the arms is controlled by two reins. These two reins represent the cerebellar

\*Read before the Eye, Ear, Nose and Throat Section of the San Francisco County Medical Society, May 28th, 1912.



innervation. If they are equally taut there is no missing; but if the right side is drawn more taut we have missing to the right. This would equal a cerebellar irritation of the center for the movement to the right; if the left side is cut the right side will naturally predominate and we have a missing to the right. In the latter case we have to deal with a paralytic symptom of the center of the movement to the left." (From Wiener Medizinische Wochenschrift, No. 34, 1911.)

#### Discussion.

Dr. H. B. Graham: The pointing symptoms to which Dr. Pischel has referred are simply a portion of a group of symptoms that have been worked on for a good while by a number of men. Probably the most noted is Von Stein. He has not gone into the pointing symptoms especially, but has worked more on the general disturbances of equilibrium—he has worked out the Romberg in connection with the vestibular tract as Barany has the disturbances of pointing, which, of course, belong to this group of general disturbances of equilibrium, whether in feet, body, or legs. Von Stein's work is, I think, most interesting. He has constructed a goniometer by which he measures a person's ability to keep in an erect position during cerebellar affections. He has also worked out the ability of a man to hold his erect position in relation to different colors on the wall. For instance, if one places a man with certain cerebellar disturbances in front of a red wall, he acts differently than when in front of a green, blue, white, black or orange wall. Barany's work on these pointing symptoms of the arm, shoulder, leg, wrist, feet and knee were pretty well worked out when I was in Vienna. The data which Dr. Pischel has given was, I believe, presented in London before the British Medical Association. They are extremely interesting, but at times confusing because, possibly, of inaccuracies in observation and application. I have seen some cases here with Dr. Schaller, which have not worked out entirely satisfactorily. I diagnosed one or two cases as cerebellar affections from errors in pointing, and found that afterward the error disappeared. One or two made changes in these pointing movements which I had not expected. Whether Barany has published anything of that character, I do not know; I have not seen anything. He may be running into some difficulties but is saying nothing about them until they are more completely investigated, as so many who publish discoveries are apt to do. Barany told me he was encountering irregularities, and I have also found these difficulties and have not known how to explain them. Whether actual errors in my acuteness of observation, or whether errors in the principle on which he works, I do not know. Horsley was certainly interested in Barany's work, and a number of his cases were examined by Barany before and after operation, and were correctly diagnosed, which is a strong argument in favor of Dr. Barany's work. The pointing to right and left has been demonstrated by Barany on cases operated for mastoid disease when the posterior fossa was exposed and the cerebellar surface frozen; he found that certain areas governed certain joints, and that errors in pointing were produced by freezing these areas. I would advise anybody interested in this work to take up the subject as a whole and work it out, and not to pay attention to one man's work in contradistinction to all others.

Dr. W. F. Schaller: At the Relief Home there is a case of cerebellar disease in which I mean to try these tests in the near future. In a case of cerebellar lesion (softening) of the left cerebellar hemisphere, which came to autopsy, there was no spontaneous nystagmus or errors in pointing. We

have no rotary stool at the Relief Home, and I regret that I delayed until too late to make the examination at the clinic. I believe that this would have been a very instructive case in the light of Barany's tests. A correct diagnosis and localization was made, however, in this instance without their aid.

#### GENERAL ANESTHESIA IN CATARACT WORK.\*

By VARD H. HULEN, M. D., San Francisco.

None of the text-books on ophthalmology give as much space to the discussion of this subject as its importance demands. Some authorities do not mention it at all, now and then a writer may recommend it for more general adoption, others condemn it absolutely excepting in the case of children and adults known to be wholly irresponsible. Concerning its use in these two classes there can, of course, be no difference of opinion. It is interesting to note that one author of broad experience says that he has never done a cataract operation under general anesthesia, while another operator reports having extracted the cataracts from both eyes at one operation under chloroform anesthesia with excellent results in each eye.

The most skillful cataract operator cannot obtain satisfactory results unless he has an obedient patient and reasonable control of the eye during the entire procedure. All of us have had or have seen unsatisfactory eyes following cataract extraction due only to the bad action of the patient at the time of the operation, a considerable loss of vitreous having been sustained or the proper replacement of the iris and a satisfactory "toilet of the eye" having been interfered with.

The operator is to a large extent at the mercy of his patient and, for my part, the anxiety accompanying a cataract operation under local anesthesia cannot be duplicated. When, in addition, the dread and apprehension of the average cataract patient is considered our wonder increases at the large percentage of useful eyes obtained under a local anesthetic. Again, when the operator confidently expects good behavior upon the part of the patient there can be no question as to his preference for local anesthesia in that case, though this confidence may be sadly misplaced. For instance, on October 16th, last year, I extracted a senile cataract from the left eye of a patient whose actions on this occasion were perfect, but when I operated upon her right eye on November 23rd following, under precisely the same condition, my confidence in the good behavior of the patient was unquestioned yet she then proved to be the prize "bad actor," and while the first eye would have been a credit to a master operator the second eye in appearance now would disgrace an awkward tyro.

A satisfactory general anesthetic for cataract work would practically eliminate the personal equation of patients, obviate their mental suffering and abolish the operator's anxiety and apprehension over things he realizes cannot be controlled.

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.

Secondly, under general anesthesia the field of operation could be rendered more nearly sterile by the use of copious douching with stronger antiseptics than should now be used under local anesthesia. Thirdly, unavoidable complications arising during the operation could be met more successfully. Fourthly, it is more practical to suture the section under general anesthesia, and I believe a suture to be most desirable especially when the section is large, as must be the case in extraction in capsule by any method.

The disadvantages of a general anesthetic are: first, the danger to life from the anesthetic, but this is now almost negligible; second, the elimination of the good patient's assistance in the control of the eye during the operation, the operator is then only more dependent on an assistant; third, the after effects of the anesthetic in the way of vomiting and general restlessness which may endanger to an extent the integrity of the operated eye. However, after my small experience and upon looking over the statistics of others I wonder if these dangers may not be exaggerated by some authors. Opened sections, prolapsed vitreous, incarcerated iris and intraocular hemorrhage do sometimes follow cataract extractions under local anesthesia. It has not been possible for me to prove these complications more frequent after the use of general anesthesia. Also we may find that a wider experience with a general anesthetic, as for instance, nitrous oxide gas with oxygen, will eliminate very largely the after effects of nausea, vomiting, etc. Former statistics have been based on results following ether or chloroform inhalation.

Valuable information from this contribution may come only from the gathered reports of the members of this section for, as local anesthetics have always been so universally used, individual operators even of large experiences can have had but few extractions under any general anesthetic.

With ether anesthesia I have performed five cataract extractions and beg to refer briefly indeed to the salient points noted.

Case 1. Mrs. B., aet. 45, very nervous patient with extreme myopia since childhood. Vision rapidly failed of late due principally to opacification of posterior capsule of lenses. After the patient was etherized cocaine and epinephrin were instilled. The clear lens with the opaque capsule was extracted from the right eye by my vacuum method without mishap, the manipulations were as easily made as could have been under local anesthesia in a helpful patient. A silk suture was introduced, and although the patient vomited a number of times no complications followed and the result was entirely satisfactory.

Case 2. Frau O., an irresponsible antediluvian with mature cataracts for years in both eyes, was etherized and the right cataract extracted in its capsule by my vacuum method, without assistance or complication. A cat-gut suture was introduced. Neither the ether nor the method of operation could be blamed for the patient's extraordinarily violent conduct for days following the operation, nor was it through any virtue of her own that the patient did not lose the eye completely.

Case 3. Alcoholic male, aet. 47, had a cataract removed from his right eye ten years before under local anesthesia by a very competent operator, but

no vision was obtained, the globe was somewhat atrophic. On January 8th under ether I made the usual section in the left eye with a bridge of conjunctiva remaining. While preparing the suture the patient suddenly squeezed his lids and a considerable loss of fluid vitreous resulted. The anesthetic was pushed, a silk suture introduced, the section was then completed and the lens removed by means of the wire loop. The prolapsed iris was excised and a careful toilet of the eye performed. In spite of some vomiting the subsequent healing was uneventful, though no useful vision was obtained. The fault in this case was that the patient was not fully relaxed. Being a difficult subject he had been permitted, through some delay in our preparations, to recover control of his orbicularis at a critical moment. It is extremely important that the anesthetic be profound during the entire operation as this unhappy experience teaches.

Case 4. A monocular patient whose eye it was impossible to affect by local anesthetics, as had been proved through an effort to do a preliminary iridectomy some weeks previously, was etherized and the cataract extracted with the loop after failure to deliver it by my vacuum method. The cup did not hold probably because its edge was allowed to rest on a small blood clot across the pupil. The usual silk suture was introduced. There was some vomiting for two days but no complications ensued from the anesthetic.

Case 5. Spanish woman 60 years of age had mature cataracts in both eyes. It was thought best, as she did not speak English, to use a general anesthetic for the operation on the first eye. April 2, 1912, the cataract was extracted in its capsule by my vacuum method with perfect smoothness in technic and result good so far. The silk suture was allowed to remain a week. There was no difficulty in its removal nor has there been in any of the cases. I have yet to see harmful irritation from the presence of a suture.

From my experience in the above five cases, with a few seen in the practices of others and from having observed a large number, comparatively speaking, of cataract extractions under general anesthesia (usually chloroform preceded by nitrous oxide gas) during three protracted visits to the Royal London Ophthalmic Hospital, where such operations have been frequent, I am encouraged to hope for an increased field in the use of general anesthesia, especially so if some other anesthetic may reduce or eliminate the disadvantages of ether or chloroform. For in cataract work, *everything else being equal*, both the patient and the operator would seem to have a better chance with general anesthesia to obtain useful and permanent vision.

#### Discussion.

Dr. W. S. Franklin, San Francisco: Dr. Hulen's paper is certainly an extremely interesting one. A large proportion of our patients are very old and feeble and you are going to get complications if you use general anesthesia. General anesthesia unfortunately has a tendency to make the eyes turn upwards and outwards necessitating pulling with fixation forceps, which increases the intra-ocular tension. Citing four or five cases is not sufficient; it would be necessary to have at least 1000 cases in order to compare the results of local and general anesthesia. With those patients operated under general anesthesia you have vomiting, marked increase in the blood pressure, face flushed, conjunctiva red and hyperemic and there is no question of the tremendous increase of blood pressure. I feel that it must be limited to such special cases as heretofore.

Dr. Kaspar Pischel, San Francisco: For suture

I would suggest the use of rat tail tendons, which are fine and strong; they will be absorbed in about a week. The speaker mentions as one of the advantages of general anesthesia the possible use of stronger antiseptics; I do not think that this is a good reason. In local anesthesia we can use local antiseptics as strong as we dare, but I do not consider it advantageous to use strong antiseptics in cataract operations; they are too irritating. The help of the well trained patient during local anesthesia is a decided advantage. I have made it a practice to have the patient trained to look down on command without pressing. Of course there are patients who cannot be trained. In these exceptional cases general anesthesia has to be resorted to. On my recent European trip I found the operation under local anesthesia the method of choice everywhere.

Dr. P. de Obarrio, San Francisco: One is generally likely to have a tendency to write on such subjects as one has lately had trouble with. As a matter of fact the question of general anesthesia as regarding the extraction of cataracts is a question of daily bread. In Panama I was placed in touch for many years with general surgical work and such special cases that came for treatment in the hospital were operated in the general operating room, and the cases of cataract operation that were nervous or very restless were submitted to general anesthesia as a matter of routine. I am not an advocate of general anesthesia as a routine treatment for cataract extractions except in well selected cases. The less one handles an eye as regards cataract extraction the better are the results. After operating an eye for a cataract operation, if you let the case rest absolutely for 6 or 7 days it is a revelation when you remove the bandage and find hardly any reaction on such an eye and the cure is uninterrupted. In giving general anesthesia there is always the possibility of vomiting, of bronchitis, broncho-pneumonia and death that has to be taken into consideration with the old patients. One hears of the favorable statistics of general anesthesia and that there is but a death or so among these cases from the use of ether in several thousands. The deaths thus referred to are only those which have taken place on the operating table and we do not hear of the deaths that occur from bronchitis and broncho-pneumonia or nephritis after they have been moved to the general ward. Regarding the use of sutures, whether you use silk or catgut or any other material it makes little difference; but it should be a material that is soft and pliable under the lid and that it will absorb moisture. There is no question as to the greater advantage of the conjunctival suture as against the corneal suture, when such a suture is indicated.

Dr. Wm. F. Blake, San Francisco: I have lately been using nitrous oxide and oxygen as an anesthetic where general narcosis was necessary in eye operation. During the past two months I have used this anesthetic in four cataract cases and in a case of iridectomy for glaucoma. To my mind nitrous oxide and oxygen is the most satisfactory anesthetic we can use. The preliminary dose of scopolamin quiets the patient and he comes to the table free from doubt and fear which is a very present factor in the handling of most cataract cases. The anesthetic itself seems free of any injurious after effects. The only possible objection is that the gas produces some cyanosis and heightening of the blood pressure during the time of anesthesia and for a period following. In my cases I have had the blood pressure taken before the patient went to operation and again immediately afterward and as a rule have found a rise in pressure of from five to fifteen m.m. So far, I have not seen any other objections to the use of this form of anesthesia. Following its use there has not been the least sign of nausea and when

the patient awakes he expresses himself as feeling as if he had just come out of a quiet sleep.

Dr. Louis C. Deane, San Francisco: I had the pleasure of assisting Dr. Hulen with the first case which he reports in his paper. There was a heavy deposit on the posterior capsule and high myopia. It seemed a good test for his suction removal of the lens in capsule.

On the morning of the operation the patient was found in a highly nervous state and the doctor hesitated as to the advisability of operating in this condition under local anesthesia. It was then that we decided upon a general anesthetic. Ether was given with no previous preparation and with a very satisfactory outcome.

In the past I have used general anesthetic for iridectomy in glaucoma, where cocaine was poorly absorbed on account of intra-ocular pressure, and twice for cataract previous to this case. Neither of these cases encouraged me to make a practice of it. I believe my feeling was largely due to the poor administration of the anesthetic. As we are now inclining toward the trained anesthetist, and with my experience in Dr. Hulen's case and of my own since, I feel that the use of a general anesthetic is advisable in certain cases of ungovernable patients. I can readily see why Dr. Hulen inclines toward the general anesthetic because the question of time in operating is eliminated allowing him to stitch his conjunctival flap, which is an excellent procedure as a safeguard against certain sequelae. With such a stitched corneal flap the dangers incident to vomiting from a general anesthetic are greatly lessened.

Dr. C. S. G. Nagel, San Francisco: I believe that general anesthesia in cataract extraction should be done in selected cases and the discussion which this paper opens up is a decidedly meritorious one. It strikes me that if a man would look carefully through the literature that it might help to decide the question when to use general anesthesia. I understand that general anesthesia was used largely in Europe in cataract work before cocaine was used. A few cases are not enough upon which to really reach final conclusions in such a question as this one. A short time ago I operated upon a deaf mute woman for cataract and the result was brilliant and the operation passed off so easily that I came to the conclusion that it was the general anesthesia that had contributed to the ease and success of this case. A short time afterwards I decided to extract a cataract in an alcoholic who had slight myopia. In this case the vitreous presented itself readily and I had to take the lens out with a loop. My impression that I was inclined to harbor a few weeks previously as a result of the first case that passivity of the patient was a decided help, was done away with in this latter case to that extent that I thought in a normal vitreous at least the tendon would have remained higher under cocaine and thereby the presentation of the vitreous would not happen so readily since lens would come out with less outward pressure.

Dr. Vard H. Hulen, San Francisco: I hope the members of this Section will not think that I am advocating the universal adoption of general anesthesia in extraction of cataract. I only want to suggest the possibility that we are more afraid of the disadvantages of the general anesthesia than we should be. It would be absurd to think that my experience in these few cases means much more than that an operator may have 5 cases without bad results following the use of a general anesthetic.

The statistics of Major Smith in his enormous number of cataract extractions in India in which he uses comparatively strong bichloride solutions show that his infections are exceedingly few. American patients would find copious douching of



their eyes with bichloride solution just before an operation under local anesthesia unpleasant and would be detrimental to their subsequent behavior, this would not apply when a general anesthetic is used and I believe, from Major Smith's experience, that free douching is undoubtedly advantageous.

With the general anesthetic I also use cocaine and adrenalin solutions. Cocaine has a tendency to lower the tension of the eye. In the New York Eye Infirmary it was the custom to instill after the extraction a 10% solution of cocaine with that idea in view. The control of the eye under a general anesthetic is not difficult provided the anesthesia is profound. Regarding the sutures, I have had some experience with catgut in the conjunctiva that was not favorable. In the cases that I have done so far I have never had trouble with the silk sutures though the removal of sutures in cataract cases is a very delicate manipulation.

### RADIOLOGICAL INVESTIGATION OF THE DISEASES OF THE STOMACH.\*

By C. M. COOPER, M. B., and G. L. PAINTER, M. D., San Francisco.

The introduction into medicine of the bismuth test meal whether due to Rieder or Courmelles forms a landmark in the progress of the study of diseases of the stomach, the importance of which even to-day is recognized in only a few clinics.

The test meal may consist of boiled rice, potato puree, barley broth or minced meat according to the desires of the patient, the amount for an adult is 400 grammes by weight. Two ounces of bismuth subcarbonate or bismuth oxychloride are rubbed up into a thin paste with water or milk, and the food added little by little to the bismuth suspension with which it is well mixed. The meal can be flavored with sugar of milk or raspberry juice. It should be served warm.

In many instances the facilities for the preparation of such a meal are lacking. A pint of kefir or koumyss milk with which two ounces of the bismuth salt is well mixed forms an excellent substitute. As Pfahler has shown the bismuth salt remains well suspended. The quantity mentioned is sufficient to render visible every part of the normal stomach.

Though the bismuth meal may cause some distortion, and may perhaps interfere with the normal gastric physiology, thus giving no absolute values, yet if always of the same weight and viscosity, it yields results that are directly-uniformly comparable.

This meal like the Ewald test meal is best administered in the morning when the stomach is empty.

Two radiograms should be made, one immediately subsequent to the taking of the meal, the other four hours afterwards by which time this bismuth meal should have left the stomach. If preferred the double test meal method of Haudek may be employed, the second test meal being given six hours after the first. At the time of taking this second meal a part of the first should have reached the hepatic flexure.

Lead markers should be placed, one over the

umbilicus, another over the sterno-xiphoid junction. The patient may be clad in a thin undervest, and since the main work of the stomach is done with the body in the upright posture the X-Ray investigation should be made with the body erect, the abdomen facing the plate.

The target of the X-Ray tube should be at a uniform distance (60 cm.) from the plate, and the incident perpendicular ray should pass through the lower marker.

The time of exposure depends upon the particular apparatus that is used to energize the tube, the more powerful the apparatus the shorter the exposure, and the cleaner cut the shadow images. However, excellent work can be done with the coils that have been in use for some years, especially with the aid of the newer intensifying screens.

The plates obtained must be satisfactory, i. e., the shadow of the bismuth meal should be quite white and plainly visible, the shadows of the markers should be clean cut. If the shadows be indefinite or blurred the work should be re-done.

Before attempting to interpret the plate the clinician must be familiar with the picture of the normal bismuth-containing stomach, which exhibits the following characteristics:

The shape of the shadow so obtained is best likened to that of a fish-hook or syphon, it presenting a descending, transverse and an ascending portion. Occupying the upper pole of the descending portion and therefore immediately under the inner part of the left diaphragm is the stomach air content, the so-called megenblase or stomach bubble, containing merely air it is highly transradiant. It is convex above and bounded below by a straight line which marks the upper boundary of the dense shadow thrown by the contained bismuth meal. The upper portion of this latter shadow is not uncommonly less dense than the main shadow, this lessened density being in some cases perhaps due to the collection of gastric secretion above the level of the test meal, and it has been suggested that the vertical extent of this intermediate zone may indicate in a rough way the secretory activity of the stomach. With the Koumyss meal the froth may exhibit a characteristic appearance above the level of the liquid.

The descending portion runs downwards and inwards slightly narrowing just below the stomach bubble, this narrowing having been termed by Rieder after His the *incisura cardiaca*. Again widening a little it journeys downwards and inwards and becomes continuous with the mesially placed transverse portion or stomach sac as this has been named by Grodel.

From the stomach sac the ascending portion runs upwards and slightly to the right, the shadow of the bismuth meal ending at the pylorus which is frequently represented by a shadow-free space of about a finger's breadth separating the shadow due to the gastric contents from the shadow due to a portion of the meal which has already found its way into the first part of the duodenum.

In the ascending portion near the stomach sac a slight constriction is not infrequently to be seen.

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912

This represents the position of the sphincter antri, and the portion of the shadow between this constriction and the pyloric ring represents the contents of the antrum. The segment where the ascending and descending portion join is, according to this description, the stomach sac, and the angle of junction has been termed the stomach angle.

The fundus lies in contact with the inner two-thirds of the left diaphragmatic arch. The cardiac end of the stomach is on the right side of the body of the tenth or eleventh dorsal vertebra, it is the most fixed point of the stomach.

The descending portion of the stomach lies to the left of the vertebral column, its inner border lying close and almost parallel to it. The stomach sac is situated almost medially, exhibiting about its center the shadow of the marker placed on the umbilicus. Its lower border reaches as low as the disc between the third and fourth lumbar vertebrae.

The pyloric ring is situated on a level with the first or second lumbar vertebra laterally a little to the right of the middle line.

*The size of the shadow.* The test meal as advised fills the normal stomach to above the level of the incisura cardiaca, and the different parts of the shadow occupy the anatomical areas described. Commonly the descending portion is not over a hand's breadth in width, and the ascending portion three to four finger's breadth.

*The contour of its border.* This is normally regular and clean cut, there occurring no ragged margins, no steep and marked incurvations except at the sphincter antri and no cup-like depressions. The slight narrowing at the incisura cardiaca has been alluded to. Sometimes when the exposure is a very quick one the stomach shadow registers the peristaltic contraction, the outline of the greater curvature presenting a wave-like appearance. The angle where the descending portion of the lesser curvature becomes continuous with the ascending is normally a blunt one, and owing to the obliquity of the stomach the angle may sometimes appear sharp when really blunt.

*The uniformity of the shadow.* The density of the bismuth shadow below the level of the intermediate layer is uniform if the bismuth salt be thoroughly suspended in the mixture.

If instead of the usual bismuth test meal half or double the quantity be administered, the outline of the normal stomach maintains its fundamental form unchanged. The shadow obtained reaches to the same height as that thrown by the standard meal, its individual parts varying only in breadth. This is due to the so-called peristolic function which enables it to closely embrace its contents.

If the radiogram be made with the patient prone instead of erect, the form and position of the stomach shadow is markedly different from that described. The whole shadow is now well above the level of the umbilicus. It is somewhat horn-shaped in appearance, the pylorus now representing its most caudal point,

#### FLUOROSCOPY OF THE BISMUTH MEAL-CONTAINING STOMACH.

The shadow picture exhibited on the fluoroscope is, of course, an exact replica of that thrown on the plate, though the details of its outline are not so clearly seen. The use of the screen, however, enables us to recognize readily other features which are of considerable importance.

a. During respiration the gastric shadow is seen to move downwards as the diaphragm descends, upwards as it ascends. If during fluoroscopic inspection the patient be asked to contract his abdominal muscles thus drawing in the abdomen, or if the abdomen be pushed in the shadow is seen to be raised a hand's breadth, though the position of the pylorus is little changed.

b. If one pushes a finger into the shadow mass either at its margin or into its surface, one can displace the bismuth meal from the spot indented and a bright area becomes apparent.

c. If one watches closely one can see the characteristic gastric peristaltic waves. They begin in the descending limb of the stomach, are to be seen traveling along the curvatures and cease at the sphincter antri, there leading to the concentric constriction previously spoken of. Contractions of the antrum itself then occur. These continue till the antrum is emptied, the contents passing through the pylorus or back into the proximal part of the stomach. The antrum is again formed and the whole procedure recurs, one revolution occurring about every twenty-one seconds.

d. If one kneads the shadow mass against the vertebral column the peristaltic waves become more brisk, and the contents of the antrum are massaged on into the duodenum.

#### VARIATIONS IN GASTRIC TONICITY.

The form of the shadow which has been described as that of the normal, presupposes and is dependent upon, a normal tonicity of the gastric walls. But the gastric tonus may be of different degrees even in individuals who present no gastric symptoms. Thus, according to Schlesinger, we have the hypertonic stomach, the orthotonic stomach, the hypotonic stomach and the atonic stomach, either of which may exist with or without actual organic gastric disease.

The shadow of the bismuth meal-containing hypertonic stomach as registered in the erect posture is shaped like a steer's horn, the pylorus representing its deepest point. The fish-hook form of stomach becomes, as we have already seen, somewhat like a steer's horn when the patient is prone. Holznecht firstly described this type and considers that in man as distinct from woman it represents the normal, but such a shape if obtained in the erect posture is significant of increased gastric tonicity; the emptying time of such a hypertonic stomach is from two to three hours.

The characteristics of the shadow of the orthotonic stomach have been described in full.

The shadow of the hypotonic stomach has a widened stomach sac and ascending limb, whilst the descending portion is lengthened and narrowed, the

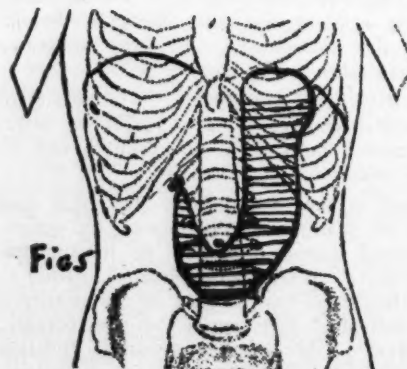
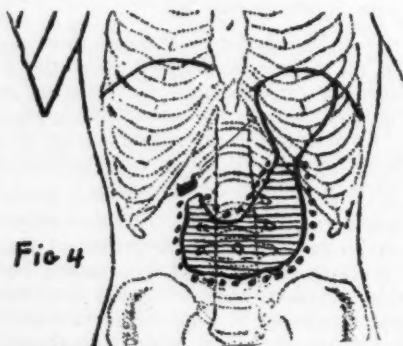
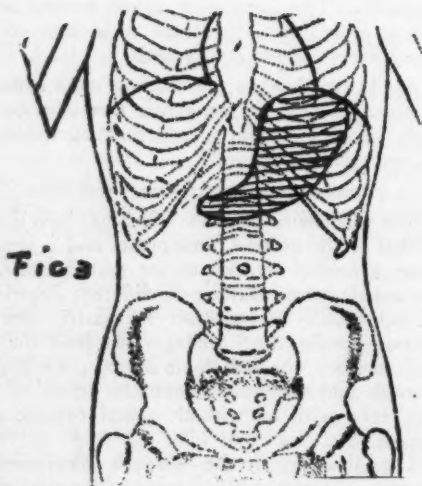
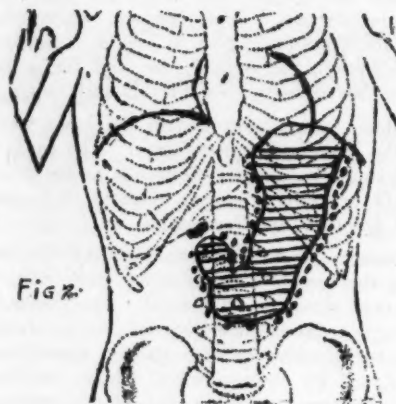
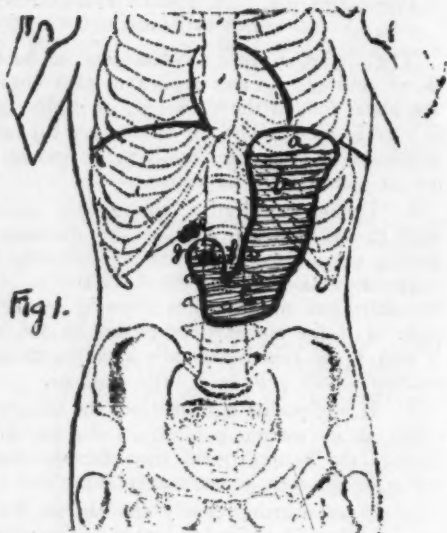


Figure 1—The normal stomach—a, magenblase; b, descending part; c, stomach sac; d, antrum of stomach; e, duodenum; f, stomach angle; g, pyloric ring.

Figure 2—The continuous line represents the outline of the bismuth-meal containing normal stomach. The dotted line, the outline after a double test meal.

Figure 3—The normal stomach with the patient lying down. Note its shape and the absence of a magenblase.

Figure 4—Atonic pseudo-hourglass stomach. Continuous line represents outline after bismuth test meal. Dotted line outline after double test meal.

Figure 5—Gastropnoia. Pylorus in position. Normal tonicity.



bismuth content, however, rising above the narrowed portion. The upper limit of the shadow is flat, the stomach bubble somewhat rectangular in shape. It empties in from four to six hours.

The shadow of the atonic stomach has its stomach sac and ascending limb still further widened, whilst the descending portion is still more thinned and narrowed. The shadow of the bismuth meal does not extend up beyond the narrowed area, and the stomach bubble is funnel-shaped. Such a stomach empties in about six hours. A double bismuth meal leads only to a widening of the shadow as described, and not to any marked additional height of the bismuth shadow.

The peristaltic and peristolic functions of the gastric muscle are independent of each other just as the similar properties of the heart muscle are.

**Gastroptosis.** In gastroptosis both limbs of the gastric shadow are lengthened and narrowed whilst the pylorus is normally situated. The lesser curvature is much too low, perhaps below the normal position of the navel. With this the peristolic function or gastric tonus is well maintained, perhaps even excessive, for the bismuth shadow extends abnormally high in the descending limb, and the stomach bubble is small and round. Groedel suggests that this gastroptotic stomach is really primarily due to a descent of the transverse colon which instead of serving as a gastric cushion now adds to the stomach load.

On the other hand most stomachs with diminished tonus exhibit some degree of gastroptosis, and the loss of tonus in its turn may occur in gastroptosed organs.

**Pyloroptosis.** In pyloroptosis there is some degree of dropping of the pylorus, and the descending part of the stomach is elongated and narrowed. This may be only part of a general enteroptosis, on the other hand the liver may have maintained its normal position, the dropped pylorus then indicating a lax gastro-hepatic omentum.

Even with a considerable pyloroptosis if the radiogram has been made with the patient prone the pylorus might appear to be normally situated. Such a postural change in the position of the pylorus is characteristic of pyloroptosis, and shows that no adhesions are present fixing the pylorus in its abnormal position. A similar change in the position of the pylorus occurs when the abdomen is voluntarily drawn in or pushed in by the examiner.

The tonus of the pyloroptotic stomach may be high, normal or low, leading to the associated characteristic variations in the filling of the descending limb, in the size of the stomach bubble, and in the emptying time of the stomach. Groedel believes that pyloroptosis may sometimes result from diminished support to and increased weighting of the stomach, it representing a later stage of gastroptosis.

**Abnormalities of secretion.** Hypersecretion according to Schlesinger is suggested by an increased breadth of the intermediate zone of the gastric shadow.

Achylia leads to insufficiency of the pylorus, so

that the emptying time of the stomach is considerably reduced, the bismuth meal all leaving the stomach in two hours or less.

In neurasthenics and hysterics who complain of gastric symptoms due to functional disturbances, the radiological examination commonly shows no departure from the normal; sometimes however in young people there is an associated hypertonicity and hypermotility. The shadow is then horn shaped, the antrum is smaller than usual and the emptying time somewhat hastened.

The diseases of other systems (tabes, Addison's disease, phthisis, brain tumor) which present in their course gastric symptoms are associated with a radiologically normal stomach, a finding which is of considerable aid in correctly interpreting the sometimes puzzling picture.

Pathological lesions in the neighborhood of the stomach, but of non-gastric origin, sometimes imitate gastric diseases. A tumor may be readily palpable, and be clinically apparently of gastric origin, but radiology may show that the tumor is outside the area of the stomach shadow, or becomes outside when the abdomen is retracted. If it indents the stomach shadow the indentation is smooth and clean cut. Splenic tumors displace to the right the cardiac end of the stomach. Left renal tumors similarly displace the stomach sac and antrum.

A painful and tender area may be present in the upper abdomen and be associated with some muscular rigidity; radiology will show whether or not this point lies within the area of the stomach, a very helpful point in diagnostic work.

Gall bladder and appendix dyspepsia unassociated with gastric changes show radiologically either no departure from the normal or a hypertonic form of stomach shadow. The sensitive point is extra ventricular.

Pericolecystitis not infrequently leads to adhesions which drag upon the pylorus and fix it up under the right rib border. The stomach shadow is high, runs diagonally across the upper abdomen, is shaped like a steer's horn, and has little mobility. Such a finding speaks for gallbladder disease.

Other perigastric adhesions lead to distortion and fixation of the stomach shadow, tooth-like projections of the shadow occurring at the adherent area.

#### ORGANIC DISEASES OF THE STOMACH WALLS.

A flat ulcer of the stomach gives rise to no abnormality of the stomach shadow, but associated with every active ulcer wherever situated is an accompanying pyloric spasm. This pyloric spasm interferes with the emptying time of the stomach, prolonging it to six hours or more. This prolongation of the emptying time, readily recognizable by the X-Ray is of great diagnostic aid, and is so uniform that it is one of the most valuable of all diagnostic points in considering whether a gastric ulcer is or is not present, and in determining whether an ulcer known to have been present has or has not healed. The tender point

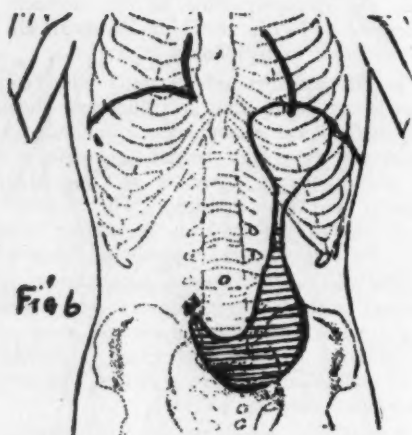


Fig 6

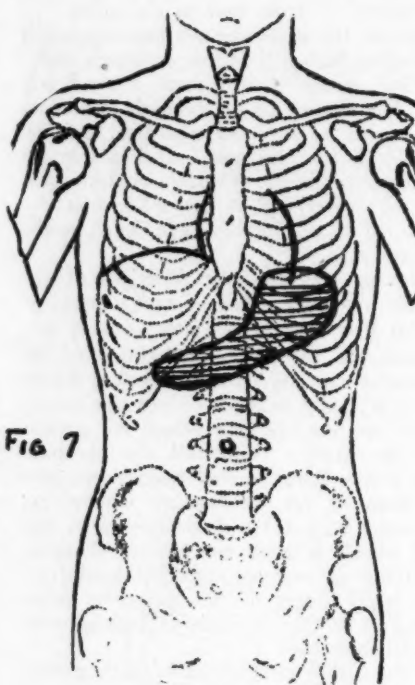


Fig 7

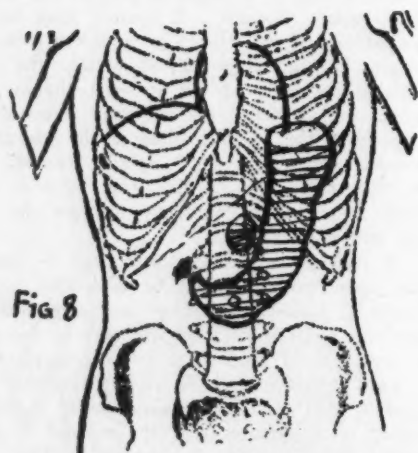


Fig 8

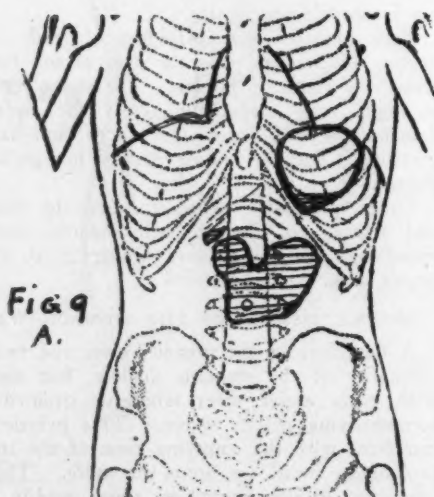
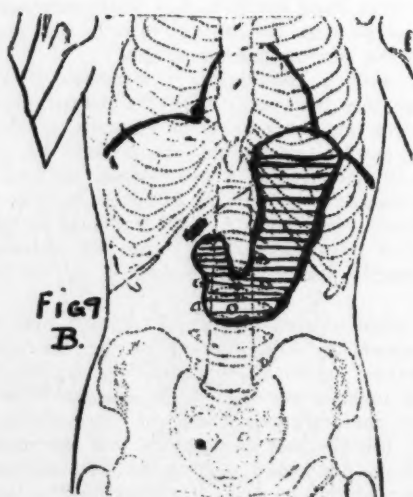
Fig 9  
A.Fig 9  
B.

Figure 6—Pyloroptotic atonic pseudo-hourglass stomach.

Figure 7—Pylorus dragged up under the right rib border by pericholecystic adhesions.

Figure 8—Penetrating ulcer of the lesser curvature.

Figure 9—Two radiograms of the same stomach at different times—a, showing hourglass stomach temporary and therefore due to spasm.

present is found to be within the stomach shadow, it as a rule corresponding to the site of the ulcer.

Duodenal ulcers lead to a hypertonic form of stomach shadow. The organ empties within the normal time, the tender point is over the duodenum. As long as a duodenal ulcer is associated with this form of stomach the chances of its healing under medical treatment are extremely good, but if dilatation be present, or the emptying time be prolonged much time will be saved if the patient be referred to the surgeon for gastro-enterostomy.

Chronic penetrating ulcers of the stomach are of not uncommon occurrence. The picture they present is striking and characteristic. Outside the normal stomach shadow, apart from but in close proximity to it, and usually on the side of the lesser curvature, is an additional bismuth shadow. This bismuth shadow has an air bubble capping it, it thus being a miniature of the gastric shadow. It is due to a part of the bismuth meal having found its way through the stomach wall into the ulcerated cavity in the neighborhood. In this cavity remnants of food may stagnate for some time, lactic acid be produced, and thus the stomach contents after a test meal may show both hydrochloric and lactic acid. Such a radiographic picture always means a penetrating ulcer, which may or may not have undergone malignant degeneration. Such a picture may not be present in an antero-posterior exposure though an oblique view might at once demonstrate it, the stomach and cavity shadows thus being separated.

A chronic ulcer may lead to an hour-glass type of stomach, a condition readily radiologically demonstrable though clinically very difficult of diagnosis. This hour-glass condition of stomach is sometimes diagnosed, however, by the radiographer when it does not exist. The following hour-glass and pseudo hour-glass stomach shadows are recognizable:

1. The atonic hour-glass stomach. The failure of the bismuth meal to collect in any amount above the narrowed pulled out portion of the descending limb, and the other characteristics we have described should be sufficient to prevent error.

2. A segment of distended bowel of an extra ventricular tumor may indent the greater curvature of the stomach leading to a pseudo hour-glass effect. The line of the lesser curvature is continuous in such cases, the distended bowel is visible, the tumor if present is palpable. We have had no difficulty in preventing confusion.

3. A spasm of a part of the descending limb of the stomach may be present perhaps associated with an ulcer. A portion of the meal may collect in the stomach sac, a portion above the spasm which may be of some extent. Spasms are temporary, organic changes are constant. Radiograms in different postures and at different times show different results, and the diagnosis becomes apparent.

4. The organic hour-glass stomach associated with an ulcer shows as a rule a transverse constriction. The connecting line of bismuth as a

rule does not arise from the most caudal point of the upper bismuth shadow, and is located near the lesser curvature. Change in posture does not change the shape of the shadow. There is an associated delay in the emptying of the lower compartment due to an accompanying dependent pyloric spasm.

5. An hour-glass stomach may result from carcinoma, the growth surrounding the midportion of the stomach. The constriction is of greater extent and more irregular in outline. There is no delay in emptying the lower compartment, but rather a hastening owing to the accompanying achylia.

A chronic ulcer on the lesser curvature pulls the pylorus upwards and to the left so that the ascending portion of the greater curvature extends further to the right than does the pylorus itself. The so-called snail-like form of shadow is thus produced. There is of course delay in emptying due to the accompanying pyloric spasm, and the residue is displaced to the left.

An ulcer of the pylorus may lead to stenosis with gastric dilatation and consequent marked delay in emptying. The radiographic diagnosis of dilatation of the stomach is difficult as long as the stomach wall retains its tone, but when atonicity is added to dilatation there is a striking discrepancy between the amount of food taken and the size of the shadow. The bismuth meal lies mainly in the stomach sac, and does not reach far up the descending or the ascending limbs. The lower border is convex, the upper border flat, a half-moon effect thus being produced. The shadow lies much further to the right than normal. If a double or triple meal be taken it may still be impossible to fill the ascending limb, and to obtain a radiographic shadow of this area it may be necessary to have the patient lie on the right side. The delay in emptying is quite marked and the shadow remaining at the end of four hours presents regular edges. The absence of a tender point over the pylorus suggests a scar rather than an active ulcer. Such a picture may occasionally be found and the obstruction be malignant in type. The pyloric edge of the residue is in such cases irregular and toothed, or a marked shadow defect may be present.

A similar discrepancy between the amount of food taken and the size of the shadow may occur in an atonic dilated stomach, in which the dilatation has secondarily followed the lack of tone, and is not dependent upon organic obstruction. The emptying time, however, is not nearly so much delayed, and the sickle-shaped residue is not displaced to the right. The occurrence of anti-peristaltic waves denotes the presence of an obstruction.

Carcinoma of the stomach leads to a growth which projects into the cavity of the stomach, thus taking up space which is normally occupied by a portion of the bismuth meal. As a result there is an absence of the dense shadow in the region of the tumor, and owing to the irregularity of the growth the outline of the defect is irregular or toothed. Such areas of shadow absence are



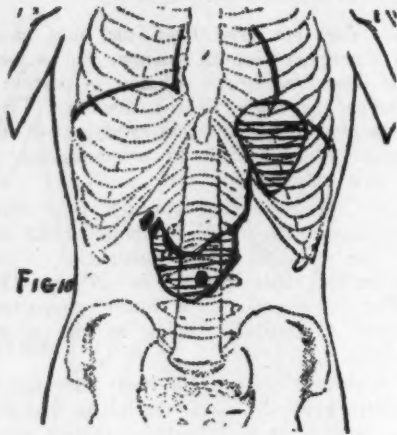


Fig 10

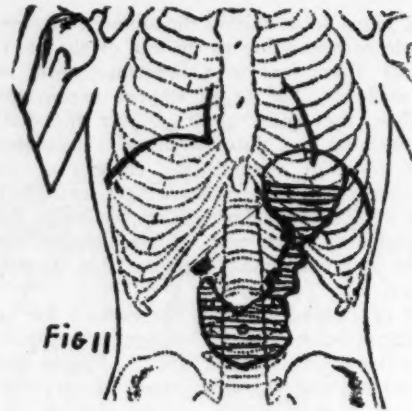


Fig 11

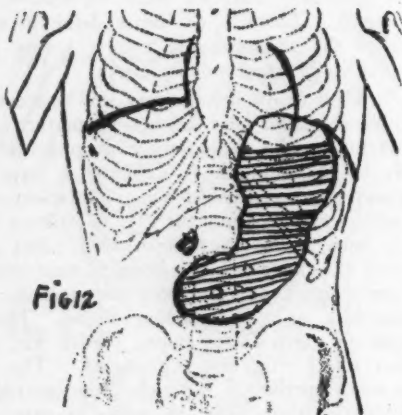


Fig 12

Fig 13

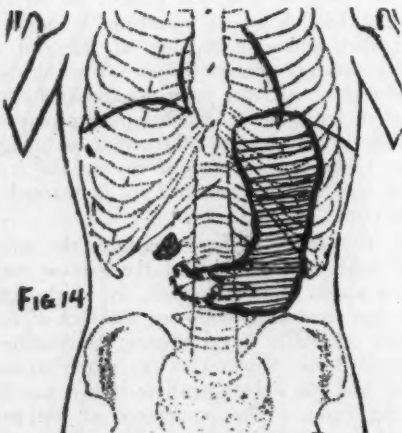


Fig 14

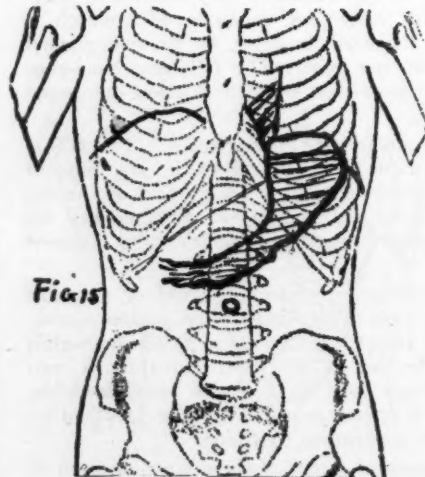


Fig 15

Figure 10—Hourglass stomach due to ulcer. Note the caudal point of the upper compartment is below the level of the beginning of the connecting band, the latter being situated near the line of the lesser curvature. The lower compartment empties slowly owing to an accompanying pyloric spasm.

Figure 11—Hourglass stomach due to carcinoma of the descending portion. Note the irregular margins of the connecting bar. Owing to the achylia the lower compartment will empty rapidly. Inoperable.

Figure 12—Note the ascending portion of the greater curvature turns upwards and inwards toward the pylorus producing the so-called snail type of shadow. Ulcer of the lesser curvature.

Figure 13—Residue after obstruction—a, from scar tissue; b, from presence of a carcinoma.

Figure 14—Carcinoma of the pylorus. Achylia. Delay in emptying. Defect in shadow at antrum. General shape of stomach shadow maintained. Operable.

Figure 15—Late shape of a scirrhus carcinoma. Note the contracted deformed shadow, the absence of the pyloric ring and the stagnation in the oesophagus. Inoperable.

highly characteristic of the presence of carcinomata in contradistinction to areas of shadow extension which are characteristic of penetrating ulcers. If a tumor be palpable and be clinically of gastric origin, and be seen radiologically to move with the stomach shadow, and no area of shadow defect be present, the tumor is probably non-malignant in type, since such tumors are commonly comparatively flat, whilst malignant tumors project into the stomach lumen. Further carcinomata lead to achylia and consequently there is no delay in emptying, but often a hastening unless the growth block the pylorus, and even then the resulting dilatation and delay in emptying is not nearly so marked as it is with stenosis due to a simple ulcer.

Three common types of gastric carcinomata are met with clinically.

1. The gastric carcinoma which develops on the basis of a simple ulcer.
2. The fungous carcinoma.
3. The diffuse infiltrating carcinoma.

Each of these varieties radiologically present differences which often render their recognition comparatively easy. With the first variety added to a shadow suggesting the presence of an ulcer there is an irregularly contoured area of shadow absence in the neighborhood which could only be due to the presence of a tumor projecting into the stomach lumen. Even if no such shadow defect be visible, the presence of hypermotility, and an emptying time within the normal will suggest that the ulcer had become malignant in character.

2. The fungous carcinoma leads to an irregularly contoured area of shadow absence in a stomach otherwise of normal form. The emptying time is within the normal unless the tumor actually block the pylorus, and achylia plus delay in emptying without shadow defect means a small pyloric growth, with shadow defect a large growth.

3. The diffuse infiltrating type of carcinoma narrows the whole pars pylorica or media. In the first case the function of the pyloric sphincter may be destroyed, and a continuous band of bismuth shadow reaches from stomach to duodenum. If the growth infiltrates the descending limb of the stomach the carcinomatous hour-glass type of stomach develops. The radiological characters of this has already been described. Dilatation of the proximal or cardiac end of the stomach then ensues, and finally the cardiac sphincter ceases to functionate, and food collects in the cardiac portion of the stomach and in the oesophagus itself, whilst that portion that passes through the hour glass constriction quickly empties into the duodenum.

Perhaps the greatest of all services which the Roentgen ray is frequently able to render the clinician in the consideration of gastric carcinomata is to tell him what cases are operable and what cases are not, and in many cases to suggest the character of the required operation. The fungous carcinomata that merely lead to a circumscribed loss of shadow, but to no general shadow distortion can be operated upon with fair hope of success

provided no metastatic growths have occurred. The infiltrating form of carcinoma that has led to a distortion of stomach shadow presents an inoperable condition, and there is no reason for performing a gastro-enterostomy since there is no pyloric obstruction.

One warning is perhaps necessary. In the erect posture the fundus of the empty stomach is occupied by air, the remainder of the organ existing as a tube whose position roughly corresponds to that occupied by the lesser curvature. If the patient lies down the air is more uniformly distributed so that the stomach has more or less the shape of a steer's horn. This is the shape of the empty dead stomach. The loaded working stomach of a man in his working posture presents quite a different appearance and the surgeon who does not keep abreast of modern teaching will find so much discrepancy between the radiological picture of the active stomach of the standing man, and the appearance presented at operation by the empty inactive stomach of his prone patient, that he will be tempted to conclude unwisely that radiological investigation of the stomach has little merit. It is a pleasure to be able to refer him to the work of Schnieden and Courmont, who now rarely perform unnecessary, useless exploratory laparotomies, they deriving from a preliminary intelligent radiological study much of the information which they could only previously acquire after opening the abdomen.

The radiological investigation of the stomach is no longer then a matter of mere academic interest, but it is an essential element in the routine study of every grave case, and in many instances it is the procedure which physician and patient can least afford to leave undone.

#### Discussion.

Dr. J. H. Barbat, San Francisco: Dr. Cooper has left very little to be said on this subject. I simply want to reiterate what has been said. I have been doing some of this work and certainly have been pleased to find that radiology of the stomach has demonstrated very definitely that the most expert diagnosticians are not able by any other means to determine in a large number of cases either the position or the motility of stomachs as definitely as can be done by radiology. I have been using the fluoroscope. The peristaltic wave can be seen distinctly, the tonicity of the stomach can be determined and we are astonished to find that even in cases diagnosed as ptosis of the stomach with retention the X-ray will often demonstrate the incorrectness of the diagnosis by revealing the exact shape and size of the organ and the time required to empty it. In these cases we must find some other cause if the symptoms persist and I feel that no surgeon should operate on any stomach case without a diagnosis confirmed by the X-ray.

Dr. W. W. Kerr, San Francisco: I have been talking with Dr. Cooper about these cases, first as to what we would judge to be a dilated stomach. A great deal of discussion has taken place frequently in going over stomachs because in the patients we found the greater curvature of the stomach below the umbilicus—that is when the stomach is distended it is in its normal field. In more than one such case I have seen operation urged because it was thought that the stomach was dilated. Dr. Cooper has brought forward the fact that the normal curvature of the stomach is one to two inches below the umbilicus. Again, when

the patient is in the prone position, of course it is above the umbilicus. That change of position therefore when we have to work without the radiogram enables us to come to some idea as to whether we are really dealing with a dilated stomach or a simple distension. The next point was in regard to the different causes that might lead to dilatation, the point upon which the doctor touched in regard to the atonic condition of the stomach muscle. I think there is no question that the stomach muscle possesses quite a number of functions very much as we have in the cardiac muscle. In many conditions we have secondary conditions giving rise to immense dilatation of the stomach which if it were treated surgically would be extremely unfortunate. In one case, a woman about 40 years of age, there was an immense fibroid existing for many years. She would be attacked at intervals with vomiting even if all food was withheld—sometimes two to three basinsful—a distinct gastric succorhea, with stomach distended down below the line of the iliac spines. In the course of treatment we washed out the stomach and it would soon contract again and be perfectly normal in outline and the patient would take a normal amount of food. I saw that occur with her at intervals of once in four weeks and then she would go along for several months. One cannot help associating such a change in the stomach with the same kind of thing we find in the cardiac muscle. The uterine fibroid in many cases seems to produce a toxin interfering with the muscle of the heart and when the fibroid is removed the patient will have a perfectly healthy heart in the course of a very short time. It is of importance to bear in mind that under similar conditions we can have a loss of tonicity leading to gastric dilatation that might tempt us to recommend gastroenterostomy and where repeated investigations would often save the patient and the surgical reputation.

Dr. R. S. Levenson, Los Angeles: It has been a great privilege to listen to this paper. It is very significant that in many of the important conclusions to which he comes as the result of the radiograms he comes to the same conclusions that I mentioned in my paper as the result of analysis and the use of the tube, especially with regard to the significance of achylia with delayed emptying. Dr. Cooper called especial attention to that as the case in carcinoma of the pylorus. In one point I take issue and that is in regard to my use of the tube. There are differences which occur and conclusions one comes to—that is with regard to the motility in duodenal ulcer. He found usually hypermobility. I usually find pyloric spasm with delayed emptying. I recall an article by a German in which he mentioned the collection of hypersecretion dependent upon the different methods used.

Dr. C. M. Cooper, San Francisco: Regarding the point made by Dr. Levenson it depends upon the stage in which you get the duodenal ulcer. Early the hypermotility more than compensates for the pyloric spasm. Later the pyloric spasm is predominant and there is delayed emptying.

### THE DIAGNOSIS OF LATENT GONORRHEA IN THE FEMALE.\*

By WALTER S. JOHNSON, M. D., San Francisco.

Recognizing the difficulty of presenting anything new on this subject, my principal aim is to promote a discussion upon this obscure condition. Therefore, I will confine myself to the diagnosis of a disease which presents only probable or un-

certain signs. My investigations were stimulated by the following case:

Mrs. L. consulted me in October, 1904, informing me that she had been accused by her husband to whom she had been married only two months, of infecting him with gonorrhea. She denied having any symptoms or any discomfort and wished me to make a thorough examination. A careful history of previous illness or complaints of any kind was negative, except for diseases of childhood. A most careful examination was made for any evidence of clinical signs and with exception of erosion of the cervix, these were practically nil. Smears were taken from the urethra and cervix and subjected to a definite amount of study. Failing to find the characteristic diplococci, I gave her a clean bill of health. Several weeks elapsed and I was served as a witness in a suit for divorce. Upon my testimony, the woman was granted her prayer before the courts. One year later, Mrs. L. again consulted me. This time her mannerisms were less defiant and her feelings were less injured. She was afraid she might have infected her friend and solicited re-examination. The clinical and bacteriologic examinations were negative as before. At her suggestion her friend came to me for examination. He received treatment for an undoubted gonorrhea. He vigorously denied having had sexual congress with anyone but the woman in question for a very long period and this was his first infection. He acknowledged having had coitus during and immediately after menses, and attributed his infection to this cause. An examination was made immediately after her next period and a number of gram negative diplococci were found. She then admitted having had an attack of some inflammatory disease of her womb which confined her to bed for a month eight years previously.

That the diagnosis of latent gonorrhea in the female possesses the utmost difficulties, is admitted by all authorities on the subject. The clinical evidence of gonorrhea is based on the presence of changes in the tissues, yet these changes are by no means pathognomonic, as they may be produced by other microorganisms or irritants.

The bacteriologic method of diagnosis, because of its limitations, is also uncertain. Notwithstanding these difficulties, with proper study of the clinical and bacteriologic evidence, we can make a diagnosis in the greater number of our cases.

The urologist and those who treat genito-urinary diseases are often called upon to diagnose cases brought for confrontation. In fact, it is not uncommon to have a female come most voluntarily for an examination upon the request of one who feels that she carries the source of his infection. She apparently is in the best of health and does not experience any discomfort. Upon examination such women present no trace of virulent disease, but have some of the probable or uncertain signs thereof.

The indefinite persistency of the infection in the latent or chronic stages may be better understood by a careful consideration of the organs usually affected and the tissue changes which may be produced by a gonorrheal infection.

In old urethritis the subjective symptoms are commonly absent. The objective signs are a milky discharge and a periurethral infiltration; the meatus is everted usually exposing one or both of the glandular orifices, which normally lie concealed just within the external meatus. There are often small

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.



patches of deep red color surrounding the meatus and visible portion of the urethra. At first appearance one would suspect a urethral caruncle, but no well-defined vascular tumor can be found.

In the chronic stage there is less diffuse distribution of the organism and of the leukocytes, the gonococci confine themselves to isolated areas in the superficial structures, particularly those areas which present to the unaided eye congested and ulcerated surface.

The examination of the vulvo-vaginal glands must be carefully noted. The gland itself may feel like a little dense sclerotic mass the size of a small bean, the residuum of an old gonorrheal infection, called by Sanger "*adenitis glandulae bartholinae scleroticans*." The duct of the gland may feel like a small, dense cord. The outlet may appear intensely red. It is likened to a flea bite and has been called the macula gonorrhoeica. We should never make a diagnosis on the macula alone.

Investigation of the vaginal secretions is far from dependable, as the area and plicate surface of the part together with the often notable quantities of its secretion not infrequently hinder discovery of the gonococcus. A reddened, inflamed, patchy or granular vagina with a milky secretion is often evidence of an old gonorrhea.

The diagnosis of latent infection of the cervix and uterus is by no means an easy one. Here we have tissue changes which may be brought about by other causes. The cervical mucous makes the discovery of the gonococcus by the microscope or culture difficult. When gonorrhea of the cervix and uterus becomes chronic, the discharge lessens and becomes mucoid or muco-purulent and mixed with many squamous epithelia which contain cocci.

According to Bumm, the prognosis is doubtful as the cocci may disappear for weeks, then reappear. Yet gonococci may be present when the mucous is clear. Chronic gonorrhea of the cervix and uterus means the presence of other bacteria together with the gonococci, a fact which still more confuses an attempt at diagnosis by the microscope or culture.

Bandler asks the question, "Are we in a position clinically to diagnose chronic gonorrhea when a few pus cells and no gonococci are found?" He believes certain cervical alterations are of importance especially when chronic urthritis is not present, when "macula gonorrhoeica" or other external evidences are entirely absent, and when tubal and peritoneal changes are not marked. He has adopted the following axiom, "That cervical erosions plus a pathologic cervico uterine discharge in nulliparae is presumptive evidence of cervico uterine gonorrhea."

The problem of diagnosis here offers greater obstacles than that which confronts us in similar conditions of the prostate where we may rely upon the history, threads in the urine, prostatic massage, etc. Suppurative endometritis, pyosalpinx, hydrosalpinx, and adnexal tumors which may be of gonorrheal origin, I will purposely omit as I wish to confine my subject to those types of the disease which present unrecognized characteristics.

The biological peculiarities of the gonococcus and the peculiar condition existing in the mucous mem-

brane of the female genital organs, greatly impair the value of bacterioscopic diagnosis. The gonococcus can be satisfactorily demonstrated only in those portions of the mucous membrane in which it is present alone or associated with few other micro-organisms. It is found most easily in the urethral secretions in vulvo vaginitis of children or in the cervical secretions of the nulliparous women, while it is much more difficult to demonstrate in the cervical secretion of the multiparous women with patulous external os. It can rarely be found in the vaginal secretion of the adult.

Another limitation of the value of bacterioscopic methods is the tendency of the gonococcus to hide in recesses and folds of the mucous membrane of the cervical tissue and to occupy the epithelium of the deeper layers. Therefore, the failure to find gonococci in no sense excludes their presence. The mere examination of a loop full of cervical discharge placed on a slide and a few moments' study does not count for much. The diagnosis which leaves no doubt can only be based on the finding of the gonococcus in the secretions or tissues. The small size of the gonococci and their scarcity in the tissues in the chronic cases, necessitates the microscopic examination of a large number of sections.

While there are limitations to the bacteriological diagnosis, they are minimized by proper studies. Under favorable conditions, such as a search immediately after menstruation, our efforts are frequently rewarded by success. While mention is made of this by some writers, its real importance has not been fully emphasized. I have selected from my records thirty-two cases of latent gonorrhea, all having been accused of infecting others. All denied ever having had the disease or suffering any discomfort. In the pre-menstrual examination, twenty-three had probable signs of the disease, seven had uncertain signs, and two had non-appreciable evidence. In the post-menstrual examination Gram negative diplococci were absolutely demonstrated.

In medico legal cases and for the purpose of determining whether the secretions are capable of causing infection, a bacteriological examination immediately after menstruation is indispensable.

The value of cultural methods in the diagnosis is seemingly uncertain. There is a diversity of opinions between the laboratory workers and eminent men who diagnose by the microscope. No careful laboratory worker would think of declaring an organism to be a gonococcus because of a so-called typical morphology, or because of an intra-leukocytic position; while the clinician considers the finding of such an organism, if it be decolorized by the Gram method, to be sufficient for an unequivocal diagnosis of gonorrhea.

In conclusion, the fact that this paper is limited to fifteen minutes, precludes the possibility of an extravagant dissertation on the subject. Purposely many points have been untouched. Nevertheless, I will again emphasize the following points, which in my opinion, escape the consideration of many workers in the field:

First, we should never pronounce a woman free

from the disease till we have made a persistent study of the entire genital tract. Second, the examination of a smear taken from the urethra, vagina or cervix and failure to find the Gram negative diplococci, in no sense excludes their presence. Third, the complete disappearance of both subjective and objective symptoms is not incompatible with the presence of gonorrhea. Fourth, in closing let me summarize my experience briefly by stating that however careful and conscientious one may be a certain percentage of cases will be misunderstood unless a thorough and searching examination be made at the cessation of the menstruation.

### THE CLINICAL FEATURES AND NEUROLOGICAL FINDINGS IN POLIOMYELITIS.\*

By THOS. J. ORBISON, M. D., Los Angeles.

The chronology of the nomenclature of the disease under discussion would indicate the uncertain steps by which we have arrived at the present name. It is marked by the clearly unsatisfactory names "Heine-Medin disease," "infantile paralysis," "infantile cerebral palsy" and the equally unscientific "epidemic paralysis." Even the name "anterior poliomyelitis" is giving way to that of "poliomyelitis." There are those who hold with Batten of England, that polioencephalomyelitis is even better as being technically more anatomically accurate. And this view is correct inasmuch as we know that the disease is not confined to the anterior cells of the spinal cord nor to the cord alone but has been found to affect any part of the nervous system. Indeed, the researches of Flexner, Peabody and Draper have demonstrated disease foci in various organs of the human body other than the nervous organs, especially the lymphatic and parenchymatous organs. (Further reference to this will be made).

A word about the chronology of the disease. In 1840 Heine published his "Beobachtungen über sahmungszustande der unteren Extremitäten," and "Die Spinale Krinderlähmung." In 1887 Medin described an epidemic in Stockholm of 44 cases which was the first important work of its kind; hence the unscientific name, "Heine-Medin disease," suggested by Wickman. "The histopathological picture of acute poliomyelitis dates from the work of Provost and Vulpian in 1866. They first directed attention to the degeneration and disappearance of the anterior cornual cells in the segments of the spinal cord controlling the paralyzed parts." (A. R. Allen in Penn. Med. Journal, Dec., 1911.)

It is of interest to note that during the last 30 years more than 75 epidemics have been reported. The greatest number of individuals affected in a single epidemic was in the one reported in Pennsylvania in 1910 in which 1076 cases were reported to Health Commissioner Dixon. It is evident that the clinical features of poliomyelitis must have been thoroughly and accurately recorded.

Clinically, therefore, poliomyelitis (polioenceph-

alomyelitis) is an acute infective disease of as yet unknown cause, having an especially selective action on the nervous system. According to Spiller we recognize the following clinical types: Abortive, spinal, encephalic (or a combination of the two), meningeal, polyneuritic, Landry's paralysis, ataxic, a possible herpetic and late atrophic type. These are for the most part clinical types in which neuropathological findings have confirmed the clinical-anatomical features. In support of these types the histological studies of the disease by Flexner, Allen, Dixon, Draper and others (both in monkeys and human beings), have shown lesions in the spinal cord, intervertebral ganglia, medulla, pons, cerebellum, cerebrum and meninges. They found that both the gray and white matter of the cord and brain are subject to injury. Going a step further they found that the pathology of this disease included lesions in the lymphatic tissues generally, including the minute lymphoid nodules in the walls of the blood vessels, bronchi and periportal connective tissue in the liver and elsewhere. Lesions that are characteristic and more or less constant were found in the lungs, spleen and liver. In the latter they were for the most part hyaline focal necrosis of liver cells of large extent and many in number. As they expressed it: "What is remarkable is the large number present in sections; a dozen or a score or more in an ordinary section." During the last few years a number of trained investigators have carried out the most exhaustive and painstaking experiments for the purpose of identifying the specific cause of this disease, the character of that cause, its "carriers," its possible "host," the means and methods of its transmissibility. Every possible angle of every known phase was minutely examined and the evidence weighed. For instance the Department of Health of Pennsylvania carried out a series of experiments with Ehrlich's "606" in the acute poliomyelitis of monkeys. They also tried the effect of formaldehyde upon the virus of the disease in vivo. They carried out a state-wide search for data that would convey information upon every phase of the disease bearing on its epidemiologic aspects. The results are now public property and I am indebted to my friend Dr. Samuel Dixon, Commissioner of Health of Pennsylvania, for furnishing me with the latest information at his command for the purposes of this paper. As President of the Academy of Natural Sciences he was well fitted for his duties as director of a state-wide investigation.

With his accustomed attention to minute detail he gathered statistics upon the following subjects: Seasonal distribution, intensive studies of 748 cases, examination of the records of 605 physicians; data as to exposures to heat, cold, cuts, swimming, wading in streams, running barefoot, prevalence of other diseases, the bites of insects; the presence as symptoms of irritability, stupor, nausea, vomiting, retraction of head, nervous twitchings, convulsions, diarrhea, constipation, retention of urine, insomnia, sleepiness, sore throat, skin eruptions, temperature changes. Attention was paid to the housing conditions, number of members of household and the

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ones affected, whether contact was direct or indirect; whether the windows were screened or not; whether plumbing was sanitary, whether garbage was exposed or not and how it was disposed of; ice supply was examined and milk supply. Foods were examined and all vermin reported. These were only a fraction of all the points that were collected, tabulated, compared and examined.

The results of these and other investigations have been both satisfactory and disappointing; because, though we seem to be upon the threshold of the discovery of the specific etiological factor, as yet we have not identified it. While able to make a shrewd guess as to its character and method of elaboration yet these, too, remain hidden.

It is satisfactory inasmuch as it has enabled one of the most formidable investigators of the dread disease, Simon Flexner, to write "The case for the treatment of human beings is less hopeless, as I view it, than is commonly believed. It should be taken into account that much of the supposed damage inflicted on the nervous system of human beings at the onset of the disease is remediable. For the brunt of the disease falls not in the nervous tissue but on the meninges where it can in turn be opposed by therapeutic measures. As many as 25% of the paralyzed may make complete recovery; and there is restored to a far larger percentage by the usual processes of delayed resolution, a considerable degree of power in and use of muscles once severely paralyzed."

The successful transmission of poliomyelitis from man to monkeys, and from monkey to monkey has demonstrated that the disease is due to a specific virus which passes through a bacteria-proof filter. Up to a very short time ago it was denied that rabbits could be infected and the disease transmitted. But this has been done and not only this but it has been transmitted from the rabbit back to the monkey.

The value that accrues to the human race at present may be measured by the value of the recommendations that have been, with reason, deduced from the information that has been gleaned from the various investigations.

The report of the committee of the American Medical Association contains, among others, the following: Preventive measures, 1, Isolation and screening of all patients known to have or suspected of having the disease.

"Two. Disinfection of all discharges from patients and of all articles used by them and their attendants.

"Three. Fumigation of the premises with formaldehyde on release from isolation.

"Four. Quarantine of persons in contact with patients is not justifiable but members of patient's families should be excluded from school during period of patient's isolation and possible incubation period.

"Five. The daily administration of hexamethylamine to those in contact with the sick is recommended."

The symptomatology of polio-encephalo-myelitis differs according to the type noted. As an example

of the abortive type a case seen by the writer in 1910 is of interest. A boy aged 8 years, seen in consultation with Dr. MacKerras of Sierra Madre, began to develop symptoms resembling influenzal meningitis: rapid breathing that was without thoracic pain (pains in joints and muscles were present, however); great sensitiveness to touch and handling; Kernig's sign positive; Babinski toe reflex present; temperature running about 102°; some retraction of the head; patient exhibited anxious facies and complained of headache and general tenderness. He did not want to be touched; knee jerks were absent.

This boy was given hexamethylamine until he was saturated, his bowels were kept open, salol and phenacetine and antipyrin were administered in appropriate doses. In a few days his symptoms became less severe and subsided. He later developed an empyema which was attended to surgically and he wholly recovered. This is the type that is oftenest seen by the internist and only occasionally comes to the notice of the neurologist except during an epidemic. It is the type that heretofore has been so often wrongly diagnosed.

The encephalic type likewise often fails of correct diagnosis: A little boy was seen in consultation because of a spastic monoplegia, inability to walk and talk and epileptiform seizures beginning in the spastic arm. A diagnosis of old polio-encephalitis was made and operation advised to remove irritating cerebral focus. This was done, the focus was found directly in the exposed area and removed, together with meningeal adhesions. The result was a very happy one inasmuch as the convulsions were stopped, intelligence greatly improved and the child was taught to walk.

The spinal type is the most common. Any neurological clinic in the larger centers of population handles many of this type yearly. Symptoms begin with a sudden malaise, possibly a chill, more or less high temperature, pain and general tenderness, diarrhea and vomiting. The child seems to be very sick but soon recovers, except a resulting paresis or paralysis that is more or less general. It may take the form of Landry's ascending or descending paralysis in which all the extremities are involved. This is most terrifying to the parents; recovery even from this type has been noted by Spiller, John K. Mitchell and others. Most often one or more isolated bundles of muscles are found to be paralyzed, e. g., selected groups of muscles of a leg and arm, etc. Generally the paralysis that is at first noted begins to improve and the only end result may be that above noted.

As an example of the combined cephalic and spinal type, I would speak of a child three years of age that was referred to the neurological clinic of the University of Pennsylvania by Dr. Crozier Griffith while I was assistant to Spiller's service in 1906. In this child, following the acute febrile onset, the knee jerk was absent on the right side and present on the left; there was a paresis of the right peronei and a flacid paralysis of the right deltoid.

The treatment was massage and electricity with



arsenic and strychnine in appropriate doses internally. The result was very good after weeks of treatment. The child could use the affected arm and the electrical reactions became normal in the affected muscles.

Polioencephalomyelitis has been so thoroughly investigated and the various manifestations of the disease complex so carefully analyzed that we should earlier and oftener make the diagnosis, even in isolated and sporadic cases.

In times of epidemic every consideration tending to prophylaxis and arrest should be unhesitatingly enforced.

### NECROSIS OF THE HYOID BONE.\*

By AD. B. BAER, B. L., B. S., D. D. S., M. D.,  
San Francisco.

History of case: Male, 24 years of age. A swelling had developed at the base of the tongue which was described as being about the size of an almond. There was also a swelling in front of the neck externally just to the right of the median line and about three-fourths of an inch below the great wing of the hyoid bone. The external swelling gradually enlarged to about the size of a small walnut, when it broke and discharged pus externally upon the anterior surface of the neck. Diagnosis of a cyst of the thyroglossal duct was made and patient was operated on by a New York surgeon, the diseased area being reached through an incision two inches in length, across the front of the neck, perpendicular to its long axis. The swelling recurred at the end of two months, when it was reoperated by a second surgeon, who made the same diagnosis. The patient then changed his residence to San Francisco for the purpose of building himself up and the condition again recurred at the end of six weeks.

By way of preliminary statement it will be recalled that the thyroid gland develops from the oral cavity in the region of the base of the tongue. The gland buds off from the base of the tongue and finally reaches its position at the front and sides of the neck. It consists of two lateral lobes which lie across and around the trachea like a horseshoe, extending upward to the thyroid cartilage and connected across the median line by a narrow transverse portion, the isthmus. In early embryonic life, the gland has a duct, the thyroglossal duct which passes from the isthmus to its original point of origin at the foramen cecum on the base of the tongue. The duct usually becomes obliterated, becoming a simple cord of epithelium. The upper opening remains as the foramen cecum on the dorsum of the tongue. In some cases the duct remains extant through life and frequently gives rise to cysts, which are known pathologically as cysts of the thyroglossal duct. A great many cases of this condition are on record, have been operated and cured. It was such a condition for which the patient has been operated.

On examination there was a three-inch scar across the front of the neck just above the thyroid cartilage. The entire area beneath the middle portion of the scar was swollen and felt soft and doughy to the touch. The left side was more swollen than the right, but there was a slight dis-

charge of pus from a very small opening just to the right of the median line. Pressure anywhere along the scar increased the flow of pus. It was not possible to feel any of the underlying structure, because of the swelling and of the scar. The opening of the sinus was too small to permit the passage of a probe. A second attempt to pass a probe the following day was again futile, for while we were able to enter the opening of the sinus at this time, the pain was so great that patient would not tolerate further manipulation.

In the course of about three days the swelling began to be felt by patient on the inside of the mouth. This swelling increased in size until it began to interfere with the patient's respiration. Using a laryngoscope, a red, inflamed mass could be seen at the base of the tongue on the left side. An opening into this area with a long curved bistoury was followed by a free discharge of pus. Washing this pus cavity daily resulted in very decidedly reducing the swelling upon the front of the neck.

The region of the sinus on the front of the neck was then thoroughly cocaineized and another attempt was made to pass a very small, flexible probe. About an inch beneath the surface, the probe came to a stop against a hard substance with a definite and unmistakable feeling of dead bone. The hyoid bone, which is the only bone in this location, could not be palpated because of the swelling. Ordinarily it lies just beneath the surface of the skin. Patient was dismissed. A very careful search of the entire medical and surgical literature of the subject revealed seven reported cases of hyoid bone necrosis. At the next visit of the patient an X-Ray picture was taken, which showed a very definite necrosis of the body of the hyoid bone. A second X-Ray was taken with a probe in the sinus and the plate showed the probe passing directly into the necrosed area.

A diagnosis of necrosis of the body of the hyoid was made and patient was advised to undergo a third operation. A specialist was called in consultation and he disagreed with the diagnosis, claiming that we had misinterpreted our X-Ray findings. He made a diagnosis of cyst of the thyroglossal duct. Patient therefore refused to submit to a third operation and again left for the country. I was called by telephone at 4 a. m. about two weeks later, saying that he was "choking to death" and could only breathe with great difficulty.

A second abscess was opened at this time just above the entrance of the trachea. The following day Dr. C. M. Cooper and Dr. M. Herzstein were called in consultation and both men agreed with our diagnosis of hyoid bone necrosis. Patient was then kept under treatment for two weeks, until the swelling had entirely disappeared, when he left for Rochester to be operated by Dr. Chas. Mayo. At this time patient's symptoms had entirely cleared; Dr. Mayo refused to operate upon our diagnosis. Patient insisted upon being kept under observation, however, and at the end of five days we received word that Dr. Mayo had removed the entire body of a necrosed hyoid bone. Patient returned to the coast in six weeks; after a lapse of five months there is as yet no sign of recurrence. The region of the removed hyoid bone is filled with dense fibrous tissue and there is no interference with the function of the tongue or with swallowing. The patient talks with a heaviness or fullness of the voice, which is accounted for by the fact that the right side of the larynx is paralyzed, the result of cutting the right superior laryngeal nerve during operation.

It is practically impossible to arrive at any satisfactory explanation as to the possible cause of this very rare condition. It is easy to see how the condition could have been associated with and mistaken for the very much more common condition, cyst of the thyroglossal duct.

\* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.

**SOCIETY REPORTS****PROCEEDINGS OF THE SAN FRANCISCO COUNTY MEDICAL SOCIETY.**

During the month of July, 1912, the following meeting was held:

**Regular Meeting, July 9, 1912.**

1. Recent Researches in Tropical Diseases. Dr. Creighton Wellman.
2. The Importance of Non-Diabetic Acidosis. Dr. E. C. Fleischner. (To be published in Calif. State Journal.)
3. Post-Operative Acidosis. Dr. C. C. Levison. (To be published in Calif. State Journal.) Discussed by Drs. Clarence Quinan, D'Arcy Power and E. C. Fleischner.

**SHASTA COUNTY.**

The Shasta County Medical Association held a meeting at Yreka on July 20th, in the Courthouse. Owing to the delayed trains, it was impossible for a number of the Shasta county doctors to get here. Those present were Dr. Legge, of McCloud; Dr. Cornish and Dr. Thompson, of Dunsuir; Dr. Nutting, of Etna; Dr. Milliken, of Fort Jones; Dr. Tebbe, of Weed; Dr. Pius, of Montague; Dr. Saylor Redding and Dr. McNulty, of Yreka. Dr. J. M. Flint, professor of surgery at the Yale University, attended the meeting as a guest of Dr. Legge. A paper by Dr. Nutting on "Fractures of the Elbow," also a paper on "Appendicitis," by Dr. Legge, were very interesting. Dr. Flint addressed the meeting on general remarks in surgical work. The visiting doctors were entertained at a dinner given by Dr. McNulty at his home.

**SOCIETY OF THE SAN FRANCISCO POLY-CLINIC.****Wednesday, August 7, 1912. 8:30 p. m.**

1. Sarcoma of Ethmoidal Cells and of Left Nasal Bone. Dr. H. L. Wagner.
2. Physical Disturbance due to Hypertrophy of Prostate. Report of the Case. Dr. Howard Somers. Discussed by Drs. M. Krotoszyner and F. Freytag.
3. Some Factors in Habitual Constipation. Dr. Raymond Russ. Discussed by Drs. Ryfkogel, Lartigau, Freytag and Russ.
4. A New Surgical Procedure for Retro-Displacement of the Uterus. Dr. S. H. Buteau, of Oakland. Discussed by Drs. Lartigau, Hoffman, Castle and Buteau.
5. Echo of the Meeting of the American Medical Association. Dr. Cullen F. Welty.

Refreshments were served after the meeting.

**SONOMA COUNTY.**

The Sonoma County Medical Society met in the office of Dr. Jackson Temple July 13th, and listened to a very able paper by Dr. W. P. Burnham, of San Francisco, on "Brain Tumors." The paper proved of much interest and was very instructive, bringing out the very latest ideas on the subject treated.

The meeting was attended by Dr. W. J. Kerr and Dr. J. J. Keating of Sebastopol; Dr. W. C. Shipley, of Cloverdale, and Drs. J. H. McLeod, A. R. Howard, J. W. Scamell, F. O. Pryor and Jackson Temple, of Santa Rosa.

**SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION.**

A meeting of the Southern California Public Health Association, called for the purpose of discussing the symptoms, treatment and methods of prevention of infantile paralysis, was held August 10th in the Council Chamber at the City Hall, Los Angeles. Over one hundred physicians, most of them health officers from various cities and towns of Southern California, from such widely divergent points as Santa Barbara on the north, San Diego on the south and Imperial on the east, were present.

The meeting was presided over by Dr. C. C. Browning, of Los Angeles, president of the association, and many interesting scientific questions in connection with the general subject were discussed, leading to the formulation of methods of prevention of the disease. At the close of the meeting it was decided that a committee of Southern California physicians should be appointed to draw up information for the prevention of the disease, which information, together with a pamphlet telling of the more important facts pertaining to the symptoms and care of infantile paralysis, should be furnished the physicians throughout this section of the state.

**NEWS NOTES FROM NEWSPAPERS.**

Bakersfield has added Dr. Peter Cuneo to its board of health.

The late Dr. W. T. Maupin left an estate which is appraised at \$33,112.

Bakersfield, it is said, is to have a Southern Pacific Hospital located there.

Santa Barbara, up to the time of writing, has remained free from poliomyelitis.

Dr. Fred. J. Crease, of Bakersfield, is a candidate for the Assembly; good luck.

San Diego, in spite of precautions, has been invaded by the dread epidemic of poliomyelitis.

It is estimated that 75,000,000 red cross seals or anti-tuberculosis "stickers" will be sold this year.

Dr. W. F. Gates, of Oroville, has announced that he is a candidate for the Assembly; good luck to him.

Dr. Beverly MacMonagle, who died in Paris in May, left an estate that is estimated to be worth \$250,000.

Sacramento has been sued for maintaining a nuisance; the nuisance is none other than the County Hospital!

At Napa State Hospital, Dr. E. J. Donnelly has been appointed to take the place of Dr. W. C. Porter, resigned.

Dr. Ellis N. Harbert has been appointed to the board of directors of the Stockton State Hospital, vice E. N. Pickle.

San Jose has been startled to learn that it has no meat inspector and that impure meat is being sold to its citizens.

Malta fever has been known to exist for a long time in the South-west; recently a case was reported in San Francisco.

In San Jose the woman's civic clubs have taken up the question of "swatting the fly" and it is expected that great activity will result.

Oakland proposes to establish a Public Welfare Commission with the object of opposing vice and also the activities of the anti-health cranks.

In Los Angeles the "sane fourth" idea worked out most wonderfully. No accidents were reported and but one fire, with a damage of \$450.

The "Great Abbo" is dead. His real name was S. S. Prosser, but he quacked around the country under the name of "Abbo" for a number of years.

To make all hospitals fireproof is the purpose of an ordinance now being considered in Los Angeles. A number of hospitals are opposing it.

Birth certificates should be filed within five days,

**Take a Look Through the  
Advertising Pages; You Will  
Learn Several Things**

as required by law. Delay in sending them causes a good deal of trouble in the office at Sacramento.

Berkeley had a violent fever of civic indignation because Dr. Gillihan, its health officer, reported that many places where food stuffs were prepared were filthy.

The new Mt. Zion Hospital, San Francisco, was dedicated on August 14th. The building cost \$280,000 and \$25,000 additional will be expended in furnishing it.

In Oakland, a clairvoyant was fined \$250 for practicing medicine illegally. She could not drive the evil spirits out of the body of the sick applicant for her treatment.

Meat inspection in San Francisco is to be greatly improved, according to a recent decision of the board of health. There is certainly room for plenty of improvement!

Dr. Washington Dodge, of San Francisco, has been appointed first vice-president of the Anglo and London-Paris Bank. He has not practiced medicine for many years.

The Fresno "Herald" is startled at a report showing the number of children, in public schools, who are not physically fit. The newspapers are waking up; that is a good sign.

In Lompoc valley, a rabid dog bit a child and later a cow. The child was given the Pasteur treatment and lived; the cow died. Sometimes children are worth more than cows or hogs.

The clerks in a store in San Diego have formed an organization with the object of studying health conditions and similar problems that directly affect them. Good idea for other stores to follow.

Poliomyelitis has appeared in Nevada, at Las Vegas, where two children in the same family have been attacked. All children under ten years of age have been excluded from public gatherings.

A case of spotted fever occurring in a sheep driver from Northern California, has been reported from the French Hospital, San Francisco. This is the third case found in this state recently.

Typhoid fever has become so prevalent in the vicinity of Sonora, and indeed in the mountain section generally, that the Standard Lumber Co. has had its men given the anti-typhoid treatment.

The radio-activity of the mineral springs of California has stimulated the interest of Dr. Jelinek who is having them tested. We expect to publish an interesting report on this matter at a later date.

Dr. T. B. McClintic, who had been working for several years on the puzzling disease, spotted fever, died of it quite recently. Another martyr to science. Why not get Senator Works to study spotted fever?

In Vallejo, one of the fasting cranks died after going without food for 43 days. Why not make up a list of people to whom we could advise this experiment? If it would work on Works it would be good work.

Dog-muzzling having been insisted upon by Dr. Powers, health officer of Los Angeles, the dog owners' association became very angry and wanted to recall Dr. Powers. Too bad a few of these cranks cannot be bitten!

The Lane Medical Library building has been completed. It is located at Sacramento and Webster streets, San Francisco, and is open to all physicians. Its stacks will hold 80,000 volumes and 30,000 can be added when needed.

Dr. Minerva Goodman has been appointed inspector of public schools in Stockton. She is to have one nurse to assist in the work of inspecting all school children. Again Stockton shows more progress than some of our other cities.

At Chico a man walked into the city hall and casually announced that the doctor had told him he had smallpox. The city hall was promptly, but quietly, vacated. And then they say we do not

need vaccination! If not, why do people run when they see a smallpox victim?

The Los Angeles "Examiner" begins an article this way: "American Medicine, which is devoted to the interests of the medical profession," etc. We had thought that "American Medicine" was exclusively devoted to promoting nostrums for the monetary gain of its owner.

Plague infected rats have been found in New Orleans and Philadelphia. Doubtless they exist in many other places but have not been found. The whole world is watching, with greatest anxiety, the spread of plague. A number of deaths have occurred in Porto Rico and Havana.

According to the Sacramento "Union," Dr. John W. Harvey, of Chico, was held for trial on the charge of committing a criminal operation upon a Mrs. Stabler whose husband is also under arrest for aiding in the operation. She alleges that her husband forced her to have it done.

In Los Angeles the motion picture men have banded with the "leaguers," the eddyites and the other freaks and quacks to oppose the sanitary ordinances issued to stop the epidemic of poliomyelitis. The edicts have hurt the motion picture business and, of course, business comes before health; dollars before lives.

"Child savagely bitten by mad dog." "Dog bites little girl; policeman kills brute." "Girl badly bitten by dog." "Many cases of rabies in San Mateo." "Palo Alto pound holds 60 suspected canines." "Instructive record of dog-bites at the bay." "Another dog mad; now muzzle yours." These are a few headings of newspaper articles. And yet a lot of people say it is cruel to muzzle dogs. Surely! let them bite your children.

#### IMPORTANT INFORMATION RELATING TO REPORTING INDUSTRIAL ACCIDENTS.

Dr. René Bine,

Secretary, San Francisco Medical Society,  
916 Butler Building, San Francisco.

Dear Sir:

Your letter of May 10th gives this Board an opportunity to explain the circumstances under which the legislature passed the law in regard to reports of accidents by physicians.

A small appropriation, \$15,000, was allowed for all statistical purposes connected with industrial accidents, of which about forty thousand occur annually in California. It was suggested that some recompense be given to physicians for sending in reports. The law, however, will be in effect for at least one year and a half. It would be impossible to give the material recompense for these sixty thousand reports, inasmuch as some of the appropriation is needed for the printing of reports, the mailing of the same, the salaries of the statistical department and the compilation of statistical material. It is obvious that the limited appropriation would not permit anything to be given to the physician, in spite of the opinion of individual members of the Board that such a step would be proper.

This law will remain in force at least until the end of June, 1913, inasmuch as new laws do not go into effect until ninety days after adjournment of the Legislature by which they are passed. The next Legislature will meet in January, adjourn during February, according to law, and resume sittings in March. This makes it probable that no change will be effective until the end of June. Such a change may be the repeal of the former act or a continuation of the reports, with a recompense of twenty-cents or so for every report filled. The Board cannot at this time promise to recommend such a change, but the physicians of the State can rest assured that the problem will be handled with appreciation for your viewpoint and your rights.

Physicians have, in many cases, questioned the right of the State to demand reports without



Scott, H. H., from Riverside to ?

- Thompson, Wm. H., from Riverside to ?  
 Tilden, A. D., from address unknown to Riverside, Cal.  
 Ware, C. D., from Cedarville to Bodie.  
**Converse, Geo. M.**, from San Francisco to Iquitos, Peru.  
 Hall, Geo. E., from Palo Alto to Long Beach.  
 Reynolds, L. G., from Ochsner Bldg., Sacramento, to 719½ K St., Sacramento, Cal.  
 Massie, A. M., from Berkeley to 995 Market St., San Francisco, Cal.  
**Minaker, A. J.**, from 146 Grant Ave., to 995 Market St., San Francisco.  
 Garner, R. W. T., from Sierraville, Cal., to Susanville, Cal.  
 Hamilton, I. B., from Los Angeles to Orosi, Cal.  
**Banks, W. H.**, from 4402 California St., to 135 Stockton St., San Francisco.  
 Pritchard, M., from Nevada to 806½ J. St., Sacramento.  
**Kelsey, J. E.**, from 2162 Vine St., Berkeley, to Acheson Bldg., Berkeley.  
 Greth, August, from Los Angeles to Oakland, Cal.  
 Jardarola, R., from San Francisco, to Los Banos, Cal.  
**Mitchell, C. O.**, from Laton to Fowler, Cal.  
**Thorwick, Martha**, from 498 Duboce Ave., San Francisco, to 450 Duboce Ave., San Francisco.  
 Caldron, E., from 809 Turk St., San Francisco, to 561 Hyde St., San Francisco.  
**Schmelz, C. J.**, from Eaglesnest, Cal., to 56 Redwood Ave., Rionido, Cal.  
 Keegan, L. T., from 614 5th St., San Diego, to 965 5th St., San Diego.  
 Sponogle, F. M., from 821 Market St., San Francisco, to 508 Merchants National Bank Bldg., San Francisco.  
 Krebs, Otto F., from San Francisco to Thayer Bldg., Oakland.  
**Artiques, J. E.**, from 205 Montgomery Ave., San Francisco, to 203 Columbus Ave., San Francisco.  
 Lamb, S. L. Halverson, from 261 8th Ave., Oakland, to 4311 Haley Ave., East Oakland, Cal.  
**Clark, E. M.**, from 526 25th St., Oakland, to Oakland Bank of Sav. Bldg., Oakland, Cal.  
**Caesar, Wm. J.**, from Pillow Blk., Richmond, Cal., to 7th and McDonald Ave., Richmond, Cal.  
**Graham, Richard Watson**, from 607 So. Hill St., Los Angeles, to Consolidated Realty Bldg., Los Angeles, Cal.  
 Thorpe, T. F., from McKittrick to San Juan, Cal.  
 Miner, W. D., from Smartsville, Cal., to Oakland, Cal.  
**Mackerras, R. H.**, from 154 W. Central Ave., Sierra Madre to Los Angeles Investment Bldg., Los Angeles, Cal.  
**Gould, N. B.**, from Gonzales, to Monterey.  
 Bowerman, A. C., from El Monte, to ?  
 Donnelly, E. F., from San Francisco, to Napa State Hospital, Napa, Cal.  
**Cook, W. H.**, from Hot Springs, to McKittrick, Cal.  
**Verrinder, H. F.**, from Redlands, to 3008 Duncan St., Berkeley, Cal.  
 Trew, N. C., from Los Angeles, to R. F. D. No. 11, Box 249 Highland Park, Los Angeles.  
**Clark, F. P.**, from State Hospital, Stockton, to P. O. Box 494, Stockton, Cal.  
**Fitzgerald, W. W.**, from 38 S. California St., to Box 113 Stockton, Cal.  
 Higgins, I. W., from First National Bank Bldg., Berkeley, to Elks Club, Berkeley, Cal.  
**Nichols, H. L.**, from 426½ J. St., Sacramento, to 909 F. St., Sacramento.  
**Hovt, H. F.**, from 332 W. 2nd St., Long Beach, to 332 W. Broadway, Long Beach, Cal.  
**Frates, F. E.**, from 593 8th Ave., San Francisco, to 602 5th Ave., San Francisco.  
 McNaught, H. Y., from 1720 Pacific Ave., San Francisco, to 135 Stockton St., San Francisco.  
**Reis, H. W.**, from 1346 Webster St., San Francisco, to 995 Market St., San Francisco.  
 Pendergrass, W. C., from Ceres, Cal., to Le Grand, Cal.  
**Toner, J. M.**, from 2396 Folsom St., San Francisco, to 16th and Folsom St., San Francisco.  
 Krebs, E. T., from Bridgeport, Cal., to Carson City, Nevada.  
 Guinan, Wm. J., from Orcutt, to Smartsville, Cal.  
 Bryan, Eugene H., from San Diego, to Chula Vista, Cal.  
 MacKechnie, C. A., from 130 Girard St., to 523 Natoma St.  
 Pritchard, M., from Tonopah, Nevada, to Sacramento, Cal.  
**Barney, T. R.**, from 1219 Broadway, Oakland, to 1429 Broadway, Oakland.  
**Woodward, A. P.**, from 312 Haight St., San Francisco, to 690 Oak St., San Francisco.  
**Kilgore, E. S.**, from Berkeley to Affiliated Colleges, San Francisco.  
**Adams, C. E.**, from Santa Clara, to Mt. View, Cal.  
**Cushman, R. A.**, from Santa Ana, Cal., to Bridgeport, Cal.  
 Dawson, B. F., from San Luis Obispo, to Corning, Cal.  
 Austin, S. A., from Pantages Theatre Bldg., Los Angeles, to 427 Temple St., Los Angeles.  
 Gleaves, C. C., from Coalinga, to 945 S. Olive St., Los Angeles.  
 Craig, M. A., from Oakland, to Lakeport, Cal.  
 Lilley, J. F., from Oakland, Cal., to 923 Forester Ave., Albuquerque, N. M.  
 Pope, Emma Wightman, from Watsonville, Cal., to 453 Shrader St., San Francisco.  
**Parish, H. L.**, from 1124 8th St., Oakland, to 1136 8th St., Oakland.  
 De Puy, C. A., from Portola to ?  
**Weber, P. H.**, from Elmhurst, Cal., to 9713 E. 14th St., Oakland, Cal.  
**Stallings, F. L.**, from Lindsay, Cal., to New Harmony, Ind.  
 Stephens, C. P., from Pinole, to Durham, Cal.  
 Fales, L. H., from addresses unknown, to Clifton, Arizona.  
 Plumb, Clara B., from Nevada to 920 Figueroa St., Los Angeles.  
 Nusbaum, Adolph, from 865 Fillmore St., San Francisco, to traveling abroad.  
**Pope, S. T.**, from Watsonville, to 135 Stockton St., San Francisco.  
**Pring, Ernest**, from Berkeley to 1373 Broadway, San Francisco.  
**Gladding, C. F.**, from Oakland, to Folsom (Prison Physician).

#### NEW MEMBERS.

Rulison, E. T., Sacramento.  
 Goodale, R. H., Manteca, Cal.

#### DEATHS.

Jackson, Craven, Los Angeles.  
 Field, H. M., Los Angeles.  
 Walker, Hugh, Elsinore, Cal.  
**Hannah, J. B.**, San Francisco, Cal.  
 Filmer-Carson-Gruver, Olive F., San Francisco.  
**Armstrong, Geo. C.**, Los Angeles.  
 Keck, John, Camp Meeker.  
 Jackson, Henry, Likely, Cal.  
 Jadarola, L. B., San Francisco.  
 Fatjo, Luis, Volta, Cal.  
 Johns, S. P., Loyalton, Cal.